MECHANICAL ELEMENTS / VALVING

- EXISTING EQUIPMENT OR PIPE TO BE REMOVED.
- GATE VALVE
- GLOBE VALVE
- PLUG VALVE
- BUTTERFLY VALVE
- BALL VALVE
- SWING CHECK VALVE
- LIFT CHECK VALVE
- GATE VALVE, ANGLE
- GLOBE VALVE, ANGLE
- DIAPHRAGM VALVE
- BALANCING VALVE
- CBV — CIRCUIT SETTING BALANCING VALVE
- THREE WAY CONTROL VALVE
- TWO WAY CONTROL VALVE
- S — SOLENOID VALVE
- PRV — PRESSURE REDUCING VALVE (PRV)
- TPV — TEMPERATURE/PRESSURE RELIEF VALVE
- AIR VENT — HYDRAULIC SEPARATOR
- RELIEF/SAFETY VALVE
- GAS COCK
- AUTOMATIC FILL VALVE
- MV — MANUAL AIR VENT
- AV — AUTOMATIC AIR VENT (EXTEND DISCHARGE TO DRAIN)
- FLOW METER-VENTURI
- FLOW METER-ORIFICE
- DIRECTION OF FLOW
- R D — DIRECTION OF PITCH-RISE OR DROP
- STRAINER
- STRAINER WITH BLOW OFF VALVE
- PIPE RISING UP
- PIPE DROPPING DOWN
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- UNION - SCREWED OR FLANGED
- STEAM LEAK DETECTOR
- FSD — FIRE SMOKE DAMPER
- CO — CARBON MONOXIDE
- CD — CARBON DIOXIDE
- AIR SEPARATOR
- A — ANCHOR
- G — GUIDE
- EJ — EXPANSION JOINT
- FS — FLOW SWITCH
- TT — TEMPERATURE TRANSMITTER
- PT/PS — PRESSURE TRANSMITTER OR PRESSURE SWITCH
- TH — THERMOMETER
- GAUGE WITH GAUGE COCK & SYPHON (STEAM)
- AQUASTAT
- GAS PRESSURE REGULATOR
- FLOAT OPERATED CONTROL VALVE
- STEAM TRAP
- EXPANSION LOOP
- VB — VACUUM BREAKER
- T — THERMOSTAT
- S — DIGITAL SENSOR
- OR — PUMP
- HEAT EXCHANGER

HVAC & DUCTWORK SYMBOLS

- SECTION THROUGH RETURN DUCT
- SECTION THROUGH EXHAUST AIR DUCT
- SECTION THROUGH SUPPLY OR OUTSIDE AIR DUCT
- FSD — FIRE / SMOKE DAMPER
- SD — SMOKE DAMPER
- SUPPLY OR OUTSIDE AIR DUCT
- ACCESS DOOR (BOTTOM OR SIDE)
- ACOUSTICALLY LINED DUCT
- FD - SD - FSD — FIRE DAMPER, SMOKE DAMPER, FIRE/SMOKE DAMPER
- VD — MANUAL VOLUME DAMPER
- D — INCLINED DROP IN DIRECTION OF ARROW
- R — INCLINED RISE IN DIRECTION OF ARROW
- TRANSITION, RECTANGULAR TO ROUND
- FLEXIBLE DUCT
- IN-LINE FAN
- TRANSITION, RECTANGULAR
- SPIN-IN COLLAR INTO ADAPTER ON TOP OF DUCT
- CEILING SUPPLY AIR REGISTER/GRILLE
- SIDEWALL SUPPLY AIR REGISTER (SR)
- ELBOW TURNED DOWN
- ELBOW TURNED UP
- ELBOW, RADIUS TYPE
- ELBOW, SQUARE OR RECTANGULAR TYPE WITH AIRFOIL TURNING VANES
- CEILING RETURN AIR REGISTER (RR)
- SIDEWALL RETURN AIR REGISTER (RR)
- OPEN END DUCT
- FXC — FLEXIBLE CONNECTION

LINE DESIGNATION SYMBOLS

- CHWR — CHILLED WATER RETURN
- CHWS — CHILLED WATER SUPPLY
- CA — COMPRESSED AIR
- CR — CONDENSER WATER RETURN
- CS — CONDENSER WATER SUPPLY
- D — DRAIN
- HPR — HEAT PUMP RETURN
- HPS — HEAT PUMP SUPPLY
- HWR — HOT WATER RETURN
- HWS — HOT WATER SUPPLY
- G — NATURAL GAS
- RH — REFRIGERANT HIGH PRESSURE VAPOR
- R — REFRIGERANT LIQUID AND VAPOR LINE
- RS — REFRIGERANT SUCTION / VAPOR
- SMR — SNOWMELT RETURN
- SMS — SNOWMELT SUPPLY
- V — VENT PIPING
- POINT OF CONNECTION OF NEW TO EXISTING

RESPONSIBLE DIVISION:

UNLESS OTHERWISE INDICATED ALL HEATING, VENTILATING, AIR CONDITIONING, PLUMBING, AND OTHER MECHANICAL EQUIPMENT, MOTORS, AND CONTROLS SHALL BE FURNISHED, SET IN PLACE AND WIRED AS FOLLOWS:

ITEM	FURNISHED	SET	POWER WIRED	CONTROL WIRED
EQUIPMENT	23	23	26	--
COMBINATION MAGNETIC MOTOR STARTERS, MAGNETIC MOTOR STARTERS, VFD'S AND CONTACTORS	23(1)	26	26(2)	23
FUSED AND UNFUSED DISCONNECT SWITCHES, THERMAL OVERLOAD SWITCHES AND HEATERS, MANUAL MOTOR STARTERS	26	26	26	--
MANUAL-OPERATING AND MULTI-SPEED SWITCHES	23	26	26	26
CONTROLS, RELAYS, TRANSFORMERS	23	23	26	23
THERMOSTATS (LOW VOLTAGE) AND TIME SWITCHES	23	23	26	23
THERMOSTATS (LINE VOLTAGE)	23	23	26	26
TEMPERATURE CONTROL PANELS	23	23	26	23
MOTOR AND SOLENOID VALVES, DAMPER MOTORS, PE & EP SWITCHES	23	23(2)	--	23(2)
PUSH-BUTTON STATIONS AND PILOT LIGHTS	23	23(2)	--	23(2)
HEATING, COOLING, VENTILATION AND AIR CONDITIONING CONTROLS	23	23	26	23
EXHAUST FAN SWITCHES	23	26	26	23(2)

SUBSCRIPT FOOTNOTES:
1. MOTOR STARTER TO INCLUDE CONTROL TRANSFORMER, HOA SWITCH, (1) NO AND (1)NC AUXILIARY CONTACT, AND "ON" AND "OFF" PILOT LIGHTS.
2. IF ITEM IS FOR LINE VOLTAGE, SET IN PLACE AND CONNECT UNDER DIVISION 26. WHERE FACTORY MOUNTED ON EQUIPMENT OR ATTACHED TO PIPING OR DUCTS AND USING LINE VOLTAGE FURNISH AND SET UNDER DIVISION 23, CONNECT UNDER DIVISION 26.

ABBREVIATIONS:

44" AFF	MOUNTING HEIGHT ABOVE FINISHED FLOOR TO CENTER OF DEVICE
A	AMPS
A.D.	ACCESS DOOR
AAV	AIR ADMITTANCE VALVE
ABV	ABOVE
AC	AIR CONDITIONING UNIT
AC	ABOVE COUNTER
AD	AREA DRAIN (SEE SYMBOLS)
A.F.C.	ABOVE FINISHED CEILING
A.F.G.	ABOVE FINISHED GRADE
AIC	AMPERE INTERRUPTING CAPACITY
AFCI	ARC FAULT CIRCUIT INTERRUPTERS
A.F.F.	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALUM	ALUMINUM
AP	ACCESS PANEL OR DOOR
ATS	AUTOMATIC TRANSFER SWITCH
AV	AUDIO / VIDEO
AVG	AVERAGE
AWG	AMERICAN WIRE GAGE
BAS	BUILDING AUTOMATION SYSTEM
BB	BASEBOARD
BD	BACK DRAFT DAMPER
BFP	BACK FLOW PREVENTOR
BL	BOILER
BLDG	BUILDING
BLW	BELOW
BOB	BOTTOM OF BEAM
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BSMT	BASEMENT
BTU	BRITISH THERMAL UNIT
C	CHILLER
CAFCI	COMBINATION ARC FAULT CIRCUIT INTERRUPTERS
CAP	CAPACITY
CB	CIRCUIT BREAKER
CBV	CIRCUIT BALANCING VALVE
CCT	CORRELATED COLOR TEMPERATURE
CKT	CIRCUIT
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CI	CAST IRON
CL	CENTER LINE
CLG	CEILING
CMU	CONCRETE MASONRY UNIT
CO	CLEAN OUT
COL	COLUMN
COMP	COMPRESSOR
CONC	CONCRETE
COND	CONDENSATE
CONN	CONNECTION
CONT	CONTINUATION
CONTR	CONTRACTOR
CRI	COLOR RENDERING INDEX
CT	COOLING TOWER
CT	CURRENT TRANSFORMER
CU	CONDENSING UNIT
CU	COPPER
CUH	CABINET UNIT HEATER
CVB	CONSTANT VOLUME BOX
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
DB	DRY BULB
DEPT	DEPARTMENT
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIAG	DIAGRAM
DIFF	DIFFERENTIAL
DISCH	DISCHARGE
DIV	DIVISION
DN	DOWN
DS	DUCT SILENCER
DWG	DRAWING
DX	DIRECT EXPANSION
(E)	EXISTING
EA	EXHAUST AIR GRILLE/REGISTER
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ECC	ECCENTRIC
EF	EXHAUST FAN
EFF	EFFICIENCY
EL	ELEVATION
ELEC	ELECTRIC
ELEV	ELEVATOR
EM	EMERGENCY FUNCTION
ENT	ENTERING
EMT	ELECTRIC METALLIC TUBE
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
ES	END SWITCH
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EX	EXHAUST
EXPAN	EXPANSION
EXT	EXTERNAL
F	DEGREES FAHRENHEIT
FA	FREE AREA
FC	FAN COIL UNIT
FC	FOOTCANDLE
FCV	FLOW CONTROL VALVE
FD	FIRE DAMPER
FD	FLOOR DRAIN
FIN	FINISHED
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FLR	FLOOR
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FP	FIRE PROTECTION
FP	FIRE PUMP
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FS	FLOW SWITCH
FSD	FIRE/SMOKE DAMPER
FT	FEET
FXC	FLEXIBLE CONNECTION
GND	GROUND
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GEC	GROUND ELECTRODE CONDUCTOR
GFCI / GFI	GROUND FAULT CIRCUIT INTERRUPTER
GC	GENERAL CONTRACTOR
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRS/LB	GRAINS PER POUND
H 2O	WATER
HB	HOSE BIBB
HD	HEAD (SEE SCHEDULES)
HP	HEAT PUMP
HP	HORSEPOWER
HR	HOUR
HT	HEIGHT
HTR	HEATER
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
HX	HEAT EXCHANGER
HZ	HERTZ
ID	INSIDE DIAMETER
IG	ISOLATED GROUND
IN	INCHES
INV	INVERT
JBOX	JUNCTION BOX
K	KELVIN
KW	KILOWATT
KVA	KILO VOLT - AMPS
L	LENGTH
LAT	LEAVING AIR TEMPERATURE
LV	LAVATORY
LB	POUND
LD	LINEAR DIFFUSER
LF	LINEAR FEET
LIN	LINEAR
LIQ	LIQUID
LM	LUMEN
LRA	LOCKED ROTOR AMPS
LV	LOUVER
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSANDS OF BTU PER HOUR
MC	MECHANICAL CONTRACTOR
MCA	MINIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MD	MOTORIZED DAMPER
MDP	MAIN DISTRIBUTION PANEL
MED	MEDIUM
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MLO	MAIN LUG ONLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
MTD	MOUNTED
MUA	MAKE-UP AIR UNIT
N	NEUTRAL
NC	NORMALLY CLOSED
NEG	NEGATIVE
NIC	NOT IN CONTRACT
NL	NIGHT / SECURITY LIGHT - DO NOT SWITCH
NO	NORMALLY OPEN
NOM	NOMINAL
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER
OCC	OCCUPIED
OCP	OVER CURRENT PROTECTION
OD	OUTSIDE DIAMETER
OL	OVERLOAD
ORD	OVERFLOW ROOF DRAIN
OZ	OUNCE
PBD	PARALLEL BLADE DAMPER
PD	PRESSURE DROP
PH	PHASE
POS	POSITIVE PRESSURE
POS	POINT OF SALES
PRV	PRESSURE REDUCING VALVE
PS	PRESSURE SWITCH
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TRANSMITTER
PTAC	PACKAGED TERMINAL AIR CONDITIONER
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
RA	RETURN AIR GRILLE / REGISTER
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REL	RELIEF
REQD	REQUIRED
RF	RETURN FAN
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RLA	RATED LOAD AMPS
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR GRILLE / REGISTER
SC	SHORT CIRCUIT
SCA	SHORT CIRCUIT AVAILABLE
SCCR	SHORT CIRCUIT CURRENT RATING
SCH	SCHEDULE
SD	SMOKE DAMPER
SEF	SMOKE EXHAUST FAN
SF	SUPPLY FAN
SH	SENSIBLE HEAT
SH	SHOWER
SP	STATIC PRESSURE
SPD	SURGE PROTECTION DEVICE
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
SS	SAFETY SHOWER
STD	STANDARD
STL	STEEL
SYS	SYSTEM
TEMP	TEMPERATURE
TR	TRANSFER GRILLE / REGISTER
TR	TAMPER RESISTANT
TT	TEMPERATURE TRANSMITTER
TTB	TELECOMMUNICATIONS TERMINAL BACKBOARD
TYP	TYPICAL
TX	TRANSFORMER
UC	UNDERCUT DOOR
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
UNOCC	UNOCCUPIED
UR	URINAL
V	VOLTS
VA	VOLT AMPERE
VA	VALVE
VAV	VARIABLE AIR VOLUME UNIT
VFD	VARIABLE FREQUENCY DRIVE
VRF	VARIABLE REFRIGERANT FLOW
VOLT	VOLTAGE
VTR	VENT THROUGH ROOF
W	WIDTH
W	WATTS
W/	WITH
W/O	WITHOUT
WB	WET BULB
WC	WATER COLUMN
WC	WATER CLOSET
WG	WATER GAUGE
WP	WEATHERPROOF
WPIU	WEATHERPROOF IN-USE
WSR	WITHSTAND RATING
XFMR	TRANSFORMER

SUBSTITUTIONS:

A. SUBSTITUTIONS: SUBSTITUTION OF SPECIFIED EQUIPMENT WILL BE ALLOWED THROUGH A PRIOR APPROVAL PROCESS INITIATED BY THE CONTRACTOR. CONTRACTOR SHALL SUBMIT INTENDED SUBSTITUTION AT LEAST FIVE DAYS PRIOR TO BID FOR APPROVAL FROM ENGINEER. SUBMITTAL SHALL INCLUDE CAPACITIES, DIMENSIONS AND OPERATING INSTRUCTIONS FOR EACH PIECE OF EQUIPMENT. SUBSTITUTION SHALL OCCUR AT NO COST TO THE OWNER. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF APPROVED SUBSTITUTION AND SHALL INCUR ALL COSTS ASSOCIATED WITH THE SUBSTITUTION INCLUDING STRUCTURAL MODIFICATIONS, SPACE LAYOUT AND REDESIGN COSTS. SEE ALSO DIVISION I GENERAL REQUIREMENTS.

EXAMINATION OF SITE, DRAWINGS, SPECIFICATIONS:

A. EXAMINE CAREFULLY THE SITE AND CONDITIONS OF THE SITE. PROVIDE ALL NECESSARY EQUIPMENT AND LABOR TO INSTALL A COMPLETE WORKING SYSTEM WITHIN THE SITE CONDITIONS.

B. EXAMINE THE DRAWINGS AND SPECIFICATIONS AND 5 DAYS PRIOR TO BIDDING REPORT ANY ERRORS, OMISSIONS, INCONSISTENCIES, AND CONFLICTS TO THE ENGINEER TO BE REMEDIED IN AN ADDENDUM TO THE PROJECT PRIOR TO BID TIME.

C. DRAWINGS ARE DIAGRAMMATIC AND CATALOG NUMBERS GIVEN ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE CAPACITY OF THE EQUIPMENT MEETS THE DRAWING REQUIREMENTS AND SHALL NOT DIMENSION FROM THE MECHANICAL, PLUMBING, OR PIPING DRAWINGS.

D. THE LATEST ADOPTED VERSIONS OF THE INTERNATIONAL BUILDING CODES SHALL BE USED AS REQUIRED. THIS WILL ALSO INCLUDE THE LATEST ADOPTED VERSIONS OF THE MECHANICAL, PLUMBING, AND ENERGY CONSERVATION CODES. ALL METHODS AND MATERIALS REQUIRED BY THESE CODES SHALL BE REQUIRED BY THESE SPECIFICATIONS UNLESS INDICATED OTHERWISE. OTHER APPLICABLE LOCAL CODES AND ORDINANCES SHALL BE AS REQUIRED AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO BE KNOWLEDGEABLE OF THESE REQUIREMENTS.

E. WHERE INSTALLATION PROCEDURES OR ANY PART THEREOF ARE REQUIRED TO BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER OF THE MATERIAL BEING INSTALLED, PRINTED COPIES OF THESE RECOMMENDATIONS SHALL BE FURNISHED TO THE ENGINEER PRIOR TO INSTALLATION. INSTALLATION OF THE ITEM WILL NOT BE ALLOWED TO PROCEED UNTIL THE RECOMMENDATIONS ARE RECEIVED. FAILURE TO FURNISH THESE RECOMMENDATIONS CAN BE CAUSE FOR REJECTION OF THE MATERIAL.

DO NOT REPRODUCE THESE DRAWINGS AND SPECIFICATIONS WITHOUT THE EXPRESSED WRITTEN PERMISSION OF THE DESIGNER. THE DRAWINGS AND SPECIFICATIONS ARE INSTRUMENTS OF THE SERVICE AND SHALL REMAIN THE PROPERTY OF THE DESIGNER WHETHER THE PROJECT FOR WHICH THEY ARE MADE IS EXECUTED OR NOT. THESE DRAWINGS AND SPECIFICATIONS SHALL NOT BE USED BY ANYONE ON ANY OTHER PROJECTS FOR ADDITIONS TO THIS PROJECT BY OTHERS EXCEPT BY THE EXPRESSED WRITTEN PERMISSION OF THE DESIGNER.

Bighorn Consulting Engineers, Inc.
Mechanical & Electrical Engineers
386 Indian Road
Grand Junction, CO 81501
Phone: (970) 241-8709

RIVERFRONT INDUSTRIAL PARK

MECHANICAL - COVER SHEET

1522 SHIELD DRIVE
STEAMBOAT SPRINGS, COLORADO

DATE:	ISSUED FOR:
09/17/2024	UNIT 2 - PERMIT
10/17/2024	ALL UNITS - PERMIT

COLORADO LICENSED
SHAWN P. BRUCE
25400
Shawn P Bruce
9/17/24
PROFESSIONAL ENGINEER

DATE:	09/06/2024
JOB NO:	24-056
DRAWN BY:	---
CHECKED BY:	---
SCALE:	
SHEET NUMBER:	M0-1

October 17, 2024 - 4:36:16pm

PLUMBING PIPE DESIGNATIONS

LINE TYPE	DESCRIPTION
140	HIGH TEMPERATURE (140°) WATER PIPE
	COLD WATER PIPE (CW)
CA	COMPRESSED AIR
DC	DECONTAMINATION PIPING
DER	DEIONIZED WATER RETURN
DES	DEIONIZED WATER SUPPLY
DIS	DISTILLED WATER SUPPLY
DIR	DISTILLED WATER RETURN
CD	EQUIPMENT CONDENSATE DRAIN
FP	FIRE MAIN
GW	GREASE WASTE PIPE
HE	HELIUM
HPS	HIGH PRESSURE STEAM
HPC	HIGH PRESSURE CONDENSATE
	HOT WATER RECIRCULATION (HWR)
	HOT WATER PIPE (HW)
H2	HYDROGEN
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM
MA	MEDICAL AIR
G	NATURAL GAS PIPE
N2	NITROGEN
N2O	NITROUS OXIDE
ORD	OVERFLOW STORM WATER PIPE
O2	OXYGEN
PG	PROPANE GAS
RD	ROOF DRAIN PIPE
	SOIL OR WASTE PIPE
S/O	SOIL / OIL WASTE PIPE
TWR	TOWER WATER RETURN
TWS	TOWER WATER SUPPLY
VAC	VACUUM
	VENT PIPE (V)

PLUMBING ELEMENTS / VALVING

LINE TYPE	DESCRIPTION
PRV	PRESSURE REDUCING VALVE (PRV)
	GATE VALVE
	GLOBE VALVE
	PLUG VALVE
	BUTTERFLY VALVE
	BALL VALVE
	SWING CHECK VALVE
	LIFT CHECK VALVE
	GATE VALVE, ANGLE
	GLOBE VALVE, ANGLE
TPV	TEMPERATURE AND PRESSURE RELIEF VALVE
	RELIEF/SAFETY VALVE
	GAS COCK
	GAS PRESSURE REGULATOR
	STRAINER
	STRAINER WITH BLOW OFF VALVE
WH	WATER HEATER
M	WATER METER
	PRESSURE GAGE
	TEMPERATURE GAGE

LINE TYPE	DESCRIPTION
	PIPE RISING UP
	PIPE DROPPING DOWN
	UNION - SCREWED OR FLANGED
PT/PS	PRESSURE TRANSMITTER OR PRESSURE SWITCH
TH/TI	THERMOMETER/TEMPERATURE INDICATOR
PI/GA	GAUGE WITH GAUGE COCK/ PRESSURE INDICATOR
	BACKFLOW PREVENTOR (REDUCED ZONE)
	BACKFLOW PREVENTOR (DOUBLE CHECK VALVE ASSEMBLY)
SA	WATER HAMMER ARRESTER
	CIRCUIT SETTING
HB	HOSE BIBB
RD	ROOF DRAIN
FD	FLOOR DRAIN
AD	AREA DRAIN
CO	FLOOR CLEAN OUT
FS	FLOOR SINK
COG	CLEAN OUT TO GRADE
CO	WALL CLEAN OUT
	FLEXIBLE-CONNECTION
	CHECK VALVE
	VACUUM BREAKER

RESPONSIBLE DIVISION:

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ITEM	FURNISHED	SET	POWER WIRED	CONTROL WIRED
EQUIPMENT	23	23	26	--
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MANUAL-OPERATING AND MULTI-SPEED SWITCHES	23	26	26	26
CONTROLS, RELAYS, TRANSFORMERS	23	23	26	23
THERMOSTATS (LOW VOLTAGE) AND TIME SWITCHES	23	23	26	23
THERMOSTATS (LINE VOLTAGE)	23	23	26	26
TEMPERATURE CONTROL PANELS	23	23	26	23
MOTOR AND SOLENOID VALVES, DAMPER MOTORS, PE & EP SWITCHES	23	23(2)	--	23(2)
PUSH-BUTTON STATIONS AND PILOT LIGHTS	23	23(2)	--	23(2)
HEATING, COOLING, VENTILATION AND AIR CONDITIONING CONTROLS	23	23	26	23
EXHAUST FAN SWITCHES	23	26	26	23(2)

SUBSCRIPT FOOTNOTES:
1. MOTOR STARTER TO INCLUDE CONTROL TRANSFORMER, HOA SWITCH, (1) NO AND (1)NC AUXILIARY CONTACT, AND "ON" AND "OFF" PILOT LIGHTS.
2. IF ITEM IS FOR LINE VOLTAGE, SET IN PLACE AND CONNECT UNDER DIVISION 26. WHERE FACTORY MOUNTED ON EQUIPMENT OR ATTACHED TO PIPING OR DUCTS AND USING LINE VOLTAGE FURNISH AND SET UNDER DIVISION 23, CONNECT UNDER DIVISION 26.

SUBSTITUTIONS:

A. SUBSTITUTIONS: SUBSTITUTION OF SPECIFIED EQUIPMENT WILL BE ALLOWED THROUGH A PRIOR APPROVAL PROCESS INITIATED BY THE CONTRACTOR. CONTRACTOR SHALL SUBMIT INTENDED SUBSTITUTION AT LEAST FIVE DAYS PRIOR TO BID FOR APPROVAL FROM ENGINEER. SUBMITTAL SHALL INCLUDE CAPACITIES, DIMENSIONS AND OPERATING INSTRUCTIONS FOR EACH PIECE OF EQUIPMENT. SUBSTITUTION SHALL OCCUR AT NO COST TO THE OWNER. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF APPROVED SUBSTITUTION AND SHALL INCUR ALL COSTS ASSOCIATED WITH THE SUBSTITUTION INCLUDING STRUCTURAL MODIFICATIONS, SPACE LAYOUT AND REDESIGN COSTS. SEE ALSO DIVISION 1 GENERAL REQUIREMENTS.

EXAMINATION OF SITE, DRAWINGS, SPECIFICATIONS:

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B. EXAMINE THE DRAWINGS AND SPECIFICATIONS AND 5 DAYS PRIOR TO BIDDING REPORT ANY ERRORS, OMISSIONS, INCONSISTENCIES, AND CONFLICTS TO THE ENGINEER TO BE REMEDIED IN AN ADDENDUM TO THE PROJECT PRIOR TO BID TIME.

C. DRAWINGS ARE DIAGRAMMATIC AND CATALOG NUMBERS GIVEN ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE CAPACITY OF THE EQUIPMENT MEETS THE DRAWING REQUIREMENTS AND SHALL NOT DIMENSION FROM THE MECHANICAL, PLUMBING, OR PIPING DRAWINGS.

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ABBREVIATIONS:

44" AFF	MOUNTING HEIGHT ABOVE FINISHED FLOOR TO CENTER OF DEVICE
A	AMPS
A.D.	ACCESS DOOR
AAV	AIR ADMITTANCE VALVE
ABV	ABOVE
AC	AIR CONDITIONING UNIT
AC	ABOVE COUNTER
AD	AREA DRAIN (SEE SYMBOLS)
A.F.C.	ABOVE FINISHED CEILING
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AVG	AVERAGE
AWG	AMERICAN WIRE GAGE
BAS	BUILDING AUTOMATION SYSTEM
BB	BASEBOARD
BD	BACK DRAFT DAMPER
BFP	BACK FLOW PREVENTOR
BL	BOILER
BLDG	BUILDING
BLW	BELOW
BOB	BOTTOM OF BEAM
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BSMT	BASEMENT
BTU	BRITISH THERMAL UNIT
C	CHILLER
CAFCI	COMBINATION ARC FAULT CIRCUIT INTERRUPTERS
CAP	CAPACITY
CB	CIRCUIT BREAKER
CBV	CIRCUIT BALANCING VALVE
CCT	CORRELATED COLOR TEMPERATURE
CKT	CIRCUIT
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CI	CAST IRON
CL	CENTER LINE
CLG	CEILING
CMU	CONCRETE MASONRY UNIT
CO	CLEAN OUT
COL	COLUMN
COMP	COMPRESSOR
CONC	CONCRETE
COND	CONDENSATE
CONN	CONNECTION
CONT	CONTINUATION
CONTR	CONTRACTOR
CRI	COLOR RENDERING INDEX
CT	COOLING TOWER
CT	CURRENT TRANSFORMER
CU	CONDENSING UNIT
CU	COPPER
CUH	CABINET UNIT HEATER
CVB	CONSTANT VOLUME BOX
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
DB	DRY BULB
DEPT	DEPARTMENT
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIAG	DIAGRAM
DIFF	DIFFERENTIAL
DISCH	DISCHARGE
DIV	DIVISION
DN	DOWN
DS	DUCT SILENCER
DWG	DRAWING
DX	DIRECT EXPANSION
(E)	EXISTING
EA	EXHAUST AIR GRILLE/REGISTER
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ECC	ECCENTRIC
EF	EXHAUST FAN
EFF	EFFICIENCY
EL	ELEVATION
ELEC	ELECTRIC
ELEV	ELEVATOR
EM	EMERGENCY FUNCTION
ENT	ENTERING
EMT	ELECTRIC METALLIC TUBE
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
ES	END SWITCH
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EX	EXHAUST
EXPAN	EXPANSION
EXT	EXTERNAL
F	DEGREES FAHRENHEIT
FA	FREE AREA
FC	FAN COIL UNIT
FC	FOOTCANDLE
FCV	FLOW CONTROL VALVE
FD	FIRE DAMPER
FD	FLOOR DRAIN
FIN	FINISHED
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FLR	FLOOR
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FP	FIRE PROTECTION
FP	FIRE PUMP
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FS	FLOW SWITCH
FSD	FIRE/SMOKE DAMPER
FT	FEET
FXC	FLEXIBLE CONNECTION
GND	GROUND
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GEC	GROUND ELECTRODE CONDUCTOR
GFCI / GFI	GROUND FAULT CIRCUIT INTERRUPTER
GC	GENERAL CONTRACTOR
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRS/LB	GRAINS PER POUND
H 2O	WATER
HB	HOSE BIBB
HD	HEAD (SEE SCHEDULES)
HP	HEAT PUMP
HP	HORSEPOWER
HR	HOUR
HT	HEIGHT
HTR	HEATER
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
HX	HEAT EXCHANGER
HZ	HERTZ
ID	INSIDE DIAMETER
IG	ISOLATED GROUND
IN	INCHES
INV	INVERT
JBOX	JUNCTION BOX
K	KELVIN
KW	KILOWATT
KVA	KILO VOLT - AMPS
L	LENGTH
LAT	LEAVING AIR TEMPERATURE
LV	LAVATORY
LB	POUND
LD	LINEAR DIFFUSER
LF	LINEAR FEET
LIN	LINEAR
LIQ	LIQUID
LM	LUMEN
LRA	LOCKED ROTOR AMPS
LV	LOUVER
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSANDS OF BTU PER HOUR
MC	MECHANICAL CONTRACTOR
MCA	MINIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MD	MOTORIZED DAMPER
MDP	MAIN DISTRIBUTION PANEL
MED	MEDIUM
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MLO	MAIN LUG ONLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
MTD	MOUNTED
MUA	MAKE-UP AIR UNIT
N	NEUTRAL
NC	NORMALLY CLOSED
NEG	NEGATIVE
NIC	NOT IN CONTRACT
NL	NIGHT / SECURITY LIGHT - DO NOT SWITCH
NO	NORMALLY OPEN
NOM	NOMINAL
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER
OCC	OCCUPIED
OCP	OVER CURRENT PROTECTION
OD	OUTSIDE DIAMETER
OL	OVERLOAD
ORD	OVERFLOW ROOF DRAIN
OZ	OUNCE
PBD	PARALLEL BLADE DAMPER
PD	PRESSURE DROP
PH	PHASE
POS	POSITIVE PRESSURE
POS	POINT OF SALES
PRV	PRESSURE REDUCING VALVE
PS	PRESSURE SWITCH
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TRANSMITTER
PTAC	PACKAGED TERMINAL AIR CONDITIONER
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
RA	RETURN AIR GRILLE / REGISTER
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REL	RELIEF
REQD	REQUIRED
RF	RETURN FAN
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RLA	RATED LOAD AMPS
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR GRILLE / REGISTER
SC	SHORT CIRCUIT
SCA	SHORT CIRCUIT AVAILABLE
SCCR RATING	SHORT CIRCUIT CURRENT
SCH	SCHEDULE
SD	SMOKE DAMPER
SEF	SMOKE EXHAUST FAN
SF	SUPPLY FAN
SH	SENSIBLE HEAT
SH	SHOWER
SP	STATIC PRESSURE
SPD	SURGE PROTECTION DEVICE
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
SS	SAFETY SHOWER
STD	STANDARD
STL	STEEL
SYS	SYSTEM
TEMP	TEMPERATURE
TR	TRANSFER GRILLE / REGISTER
TR	TAMPER RESISTANT
TT	TEMPERATURE TRANSMITTER
TTB	TELECOMMUNICATIONS TERMINAL BACKBOARD
TYP	TYPICAL
TX	TRANSFORMER
UC	UNDERCUT DOOR
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
UNOCC	UNOCCUPIED
UR	URINAL
V	VOLTS
VA	VOLT AMPERE
VA	VALVE
VAV	VARIABLE AIR VOLUME UNIT
VFD	VARIABLE FREQUENCY DRIVE
VRF	VARIABLE REFRIGERANT FLOW
VOLT	VOLTAGE
VTR	VENT THROUGH ROOF
W	WIDTH
W	WATTS
W/	WITH
W/O	WITHOUT
WB	WET BULB
WC	WATER COLUMN
WC	WATER CLOSET
WG	WATER GAUGE
WP	WEATHERPROOF
WPIU	WEATHERPROOF IN-USE
WSR	WITHSTAND RATING
XFMR	TRANSFORMER

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Mechanical & Electrical Engineers
386 Indian Road
Grand Junction, CO 81501
Phone: (970) 241-8709

RIVERFRONT INDUSTRIAL PARK

PLUMBING - COVER SHEET

1522 SHIELD DRIVE
STEAMBOAT SPRINGS, COLORADO

DATE:	ISSUED FOR:
09/17/2024	UNIT 2 - PERMIT
10/17/2024	ALL UNITS - PERMIT

COLORADO LICENSED
SHAWN P. BRUCE
25400
Shawn P. Bruce
10/17/2024
PROFESSIONAL ENGINEER

DATE:	09/06/2024
JOB NO:	24-056
DRAWN BY:	---
CHECKED BY:	---
SCALE:	
SHEET NUMBER:	P0-1

October 17, 2024 - 4:36:16pm

WhisperComfort® 60 *Energy Recovery Ventilator*

FV-06VE1

Specification Submittal Data / Panasonic ERV

Description

UL Listed ceiling or wall mount Energy Recovery Ventilator provides a tempered fresh air supply and balanced exhaust air flow to maintain neutral pressure throughout the home. Panasonic's WhisperComfort® 60 is not for use in a bathroom.

Motor/Blower:

- ERV supply and exhaust rates shall be manually adjustable for 20 - 30 - 40 - 50 CFM
- Two fully enclosed Panasonic DC Electronic Commutated Motors (ECM) rated for continuous run.
- ERV shall have Hi / Lo speed occupant boost capability
- Power rating shall be 120 volts and 60 Hz.
- Two highly efficient blower wheels running on two motors for lower power consumption and decreased noise.
- Motors are equipped with thermal cut-off fuse control.

Housing:

- Corrosion Resistant and Galvanized steel body.
- 2 Pressure ports allow for easy airflow verification.
- Dual 4" intake and exhaust ducts. 5" Duct connections are also available.
- Built in backdraft damper on exhaust duct.
- Filters on supply and exhaust air extend the life of the ERV core.
- Expandable mounting bracket up to 16" on center.

Grille:

- Attractive design using Polypropylene material.
- Attaches directly to housing with torsion springs.

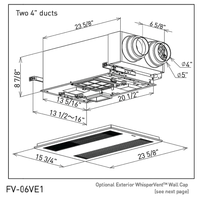
Warranty:

- DC Motors: 6 years from original purchase date
- All Parts: 3 Years from original purchase date.

Architectural Specifications:

ERV shall be ceiling or wall mount type with built-in speed selectors for both Supply and Exhaust air, select from 20/30/40/50 CFM. ERV shall have 60 CFM gross exhaust airflow and 60 CFM net supply airflow at 0.1" w.g. in accordance with HVI 916 standards. ERV shall be 2.5 sones or less at 60 CFM in accordance with HVI 915 standards. ERV shall have Hi/Lo Speed Occupant Controlled Boost Capability to 60 CFM. Power consumption shall be no greater than 39 watts at 0.1" w.g. static pressure. Sensible Recovery Efficiency for heating shall be no less than 70% at 20 CFM net air flow at 32°F (0°C) as tested in accordance with CSA C439-18. Total Recovery Efficiency for cooling shall be no less than 60% at 27 CFM net air flow under 95°F (35°C). The supply port damper shall close when outdoor temperatures are <14°F (-10°C) to prevent freezing of the core. The (2) motors shall be totally enclosed DC brushless motors rated for continuous run. Power rating shall be 120v/60Hz. Duct diameters shall be no less than 4". ERV can be used to comply with ASHRAE 62.2, LEED, IAP, California Title-24, and WA Energy Code Credits.

Two 4" ducts



FV-06VE1

Optional Exterior WhisperVent™ Wall Cap (see next page)

Maintenance:

MERV 13 filter included, replacements available

ERV Core Technology:

- Indoor and outdoor air passes through Panasonic's capillary core technology. This process tempers supply air while transferring moisture and energy.
- Built in Frost Prevention Mode prevents the core from freezing. Frost Prevention Mode is free of interaction and operates without intervention.

Performance Specifications : WhisperComfort® 60 FV-06VE1

Mode	Supply Temperature °F	Supply Temperature °C	Net Air Flow L/s	Net Air Flow CFM	Power Consumption (w)	Sensible Recovery Efficiency	Adjusted Sensible Recovery Efficiency	Net Moisture Transfer
Heating	32	0	9	20	9	70%	73%	0.7
	32	0	28	60	39	60%	63%	0.5
Cooling	95	35	13	27	12	Total Recovery Efficiency 60%		

Sound Specifications: WhisperComfort® 60 FV-06VE1

	Static Pressure "W.G	Exhaust(CFM)	Supply(CFM)	Sones
4" Duct	0.1"	40	40	0.9
	0.25"	30	30	1.2
	0.1"	50	50	1.5
	0.25"	43	42	2.0
	0.1"	60	60	2.5
	0.25"	54	52	2.5

For complete Installation Instructions visit **na.panasonic.com/us/iaq**

Panasonic
IAQ Division
Two Riverfront Plaza
Newark, NJ 07102
na.panasonic.com/us/iaq

IAQ230625T R14

Panasonic

WhisperComfort® 60 *Energy Recovery Ventilator*

FV-06VE1

Specification Submittal Data / Panasonic ERV

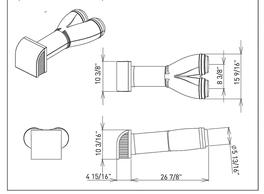
(Continued)

Model	Quantity	Comments	Project:
			Location:
			Architect:
			Engineer:
			Contractor:
			Submitted by:
			Date:

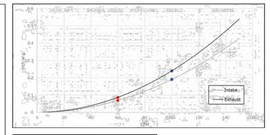
Optional Accessories

WhisperVent™ Wall Cap

Optional Exterior Wall Cap



Pressure drop curve: FV-WC10VE1 WhisperVent™ Wall Cap



FV-WC10VE1		
Pressure drops intake (inch w.g.)*	60	0.7
	100	0.19
Pressure drops exhaust (inch w.g.)*	60	0.09
	100	0.24

*measured value

Exterior Wall Cap

FV-WC10VE1 polypropylene wall cap with polystyrene adaptor allows both exhaust (from the right) and supply (from the left) airflow through a 7.5" hole in the building envelope. The dividers inside the bottom portion of the Y shape chamber and the new wall cap help prevent cross contamination.

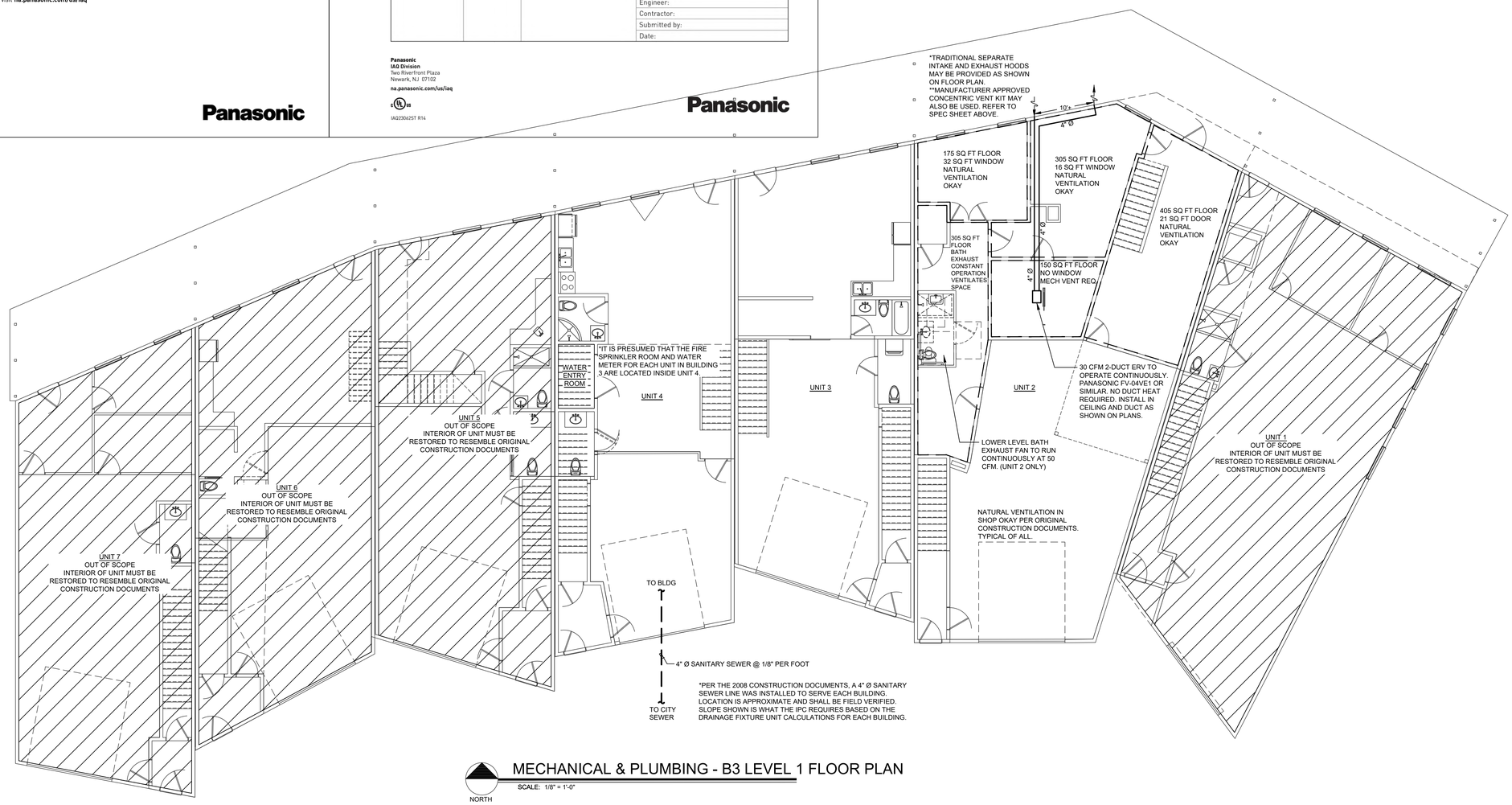
For complete Installation Instructions visit **na.panasonic.com/us/iaq**

Model	Quantity	Comments	Project:
			Location:
			Architect:
			Engineer:
			Contractor:
			Submitted by:
			Date:

Panasonic
IAQ Division
Two Riverfront Plaza
Newark, NJ 07102
na.panasonic.com/us/iaq

IAQ230625T R14

Panasonic



NORTH

MECHANICAL & PLUMBING - B3 LEVEL 1 FLOOR PLAN

SCALE: 1/8" = 1'-0"

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Mechanical & Electrical Engineers
386 Indian Road
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Phone: (970) 241-8709

RIVERFRONT INDUSTRIAL PARK

MECHANICAL & PLUMBING - B3 LEVEL 1 FLOOR PLAN

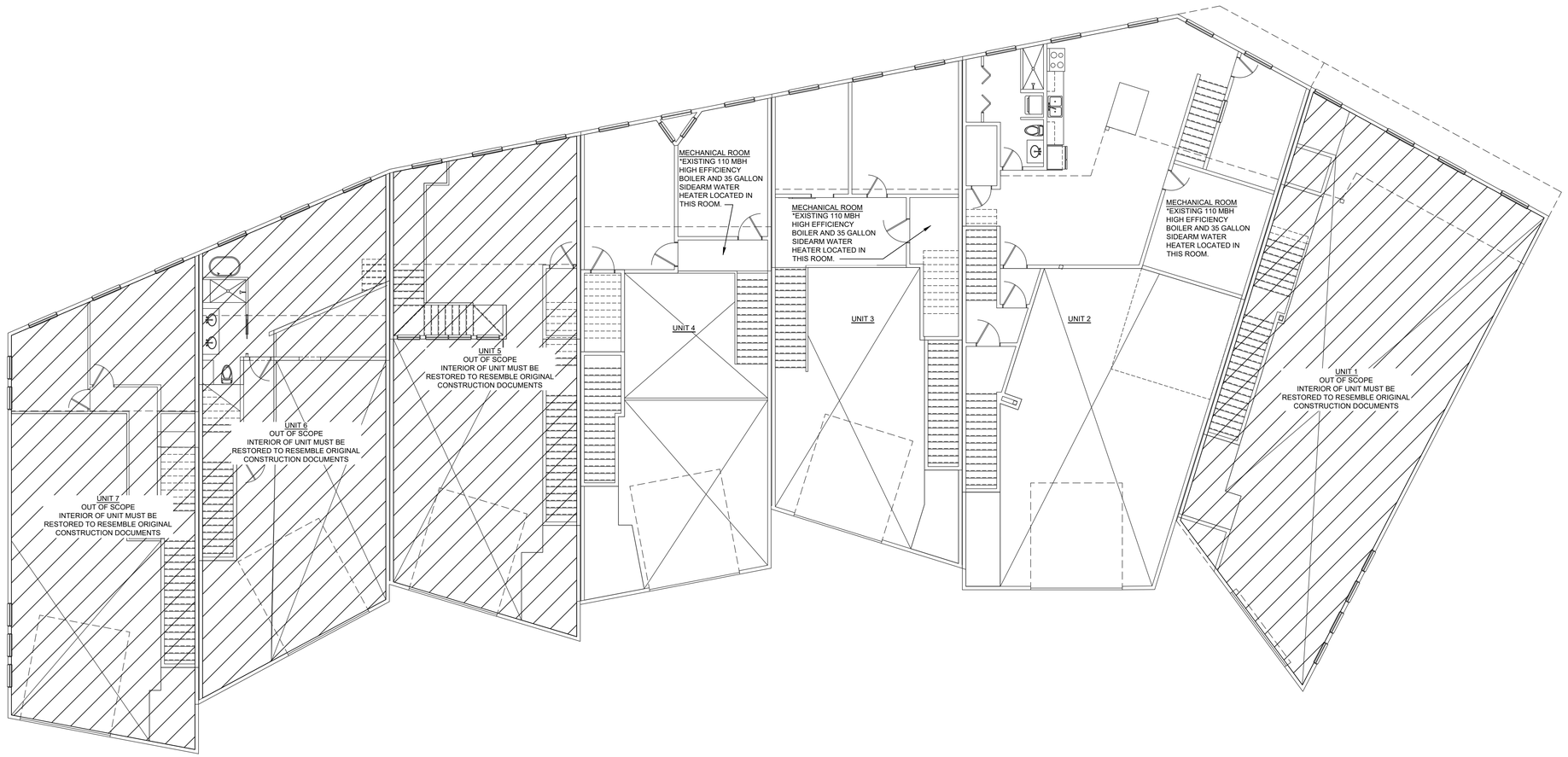
1522 SHIELD DRIVE
STEAMBOAT SPRINGS, COLORADO

DATE:	ISSUED FOR:
09/17/2024	UNIT 2 - PERMIT
10/17/2024	ALL UNITS - PERMIT

COLORADO LICENSED
SHAWN P. BRILL
25400
Shawn P Brill
10/17/24
PROFESSIONAL ENGINEER

DATE:	09/06/2024
JOB NO:	24-056
DRAWN BY:	---
CHECKED BY:	---
SCALE:	AS SHOWN
SHEET NUMBER:	MP1-1

October 17, 2024 - 4:36:17pm



MECHANICAL & PLUMBING - B3 LEVEL 2 FLOOR PLAN

SCALE: 1/8" = 1'-0"

NORTH

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RIVERFRONT INDUSTRIAL PARK

MECHANICAL & PLUMBING - B3 LEVEL 2 FLOOR PLAN

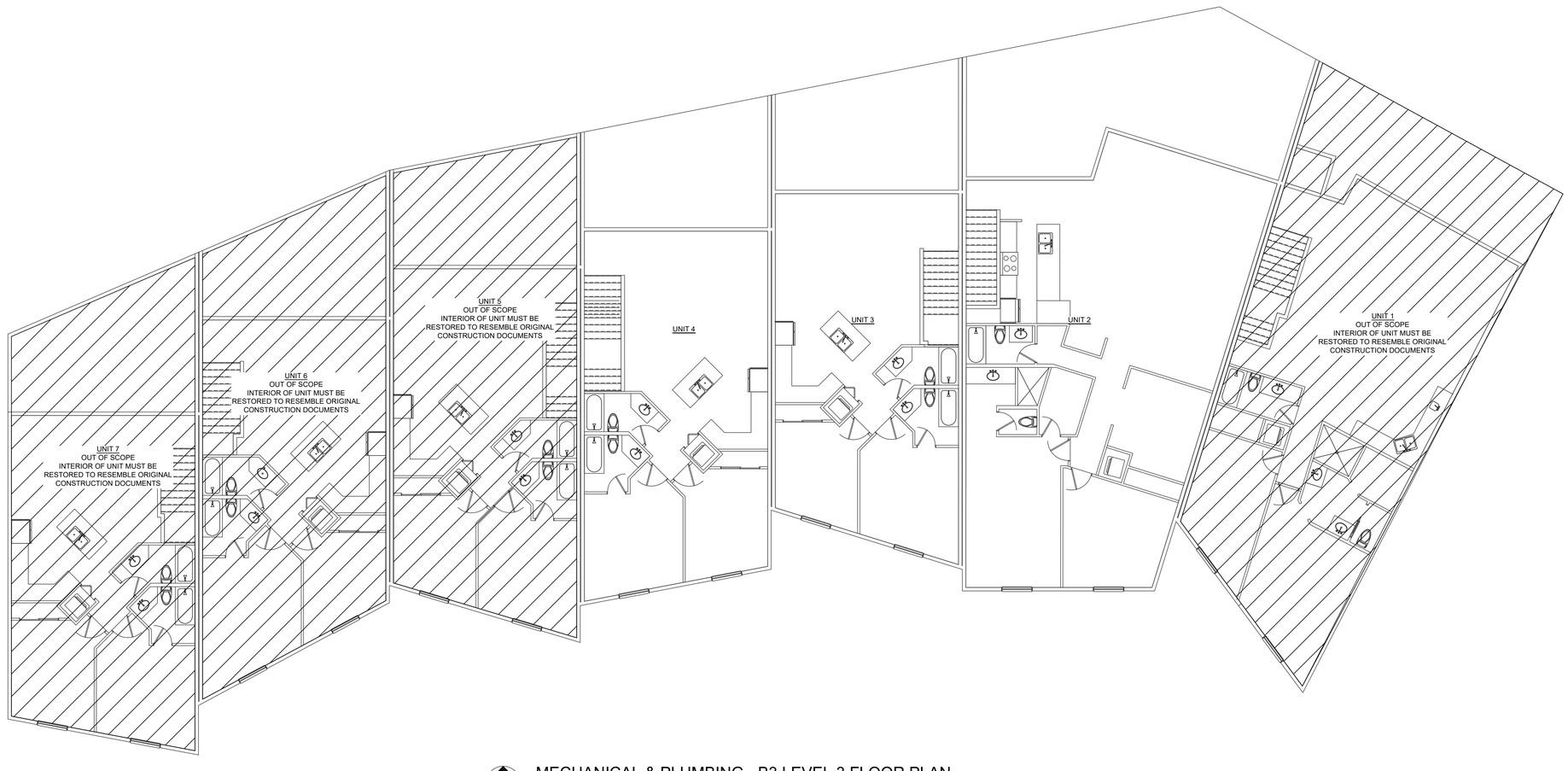
1522 SHIELD DRIVE
STEAMBOAT SPRINGS, COLORADO

DATE:	ISSUED FOR:
09/17/2024	UNIT 2 - PERMIT
10/17/2024	ALL UNITS - PERMIT

COLORADO LICENSED
SHAWN P. BRILL
25400
10/17/24
PROFESSIONAL ENGINEER

DATE:	09/06/2024
JOB NO:	24-056
DRAWN BY:	---
CHECKED BY:	---
SCALE:	AS SHOWN
SHEET NUMBER:	MP1-2

October 17, 2024 - 4:36:19pm



MECHANICAL & PLUMBING - B3 LEVEL 3 FLOOR PLAN

SCALE: 1/8" = 1'-0"

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RIVERFRONT INDUSTRIAL PARK

MECHANICAL & PLUMBING - B3 LEVEL 3 FLOOR PLAN

1522 SHIELD DRIVE
STEAMBOAT SPRINGS, COLORADO

DATE:	ISSUED FOR:
09/17/2024	UNIT 2 - PERMIT
10/17/2024	ALL UNITS - PERMIT

COLORADO LICENSED
SHAWN P. BRILL
25400
Shawn P Brill
10/17/24
PROFESSIONAL ENGINEER

DATE:	09/06/2024
JOB NO:	24-056
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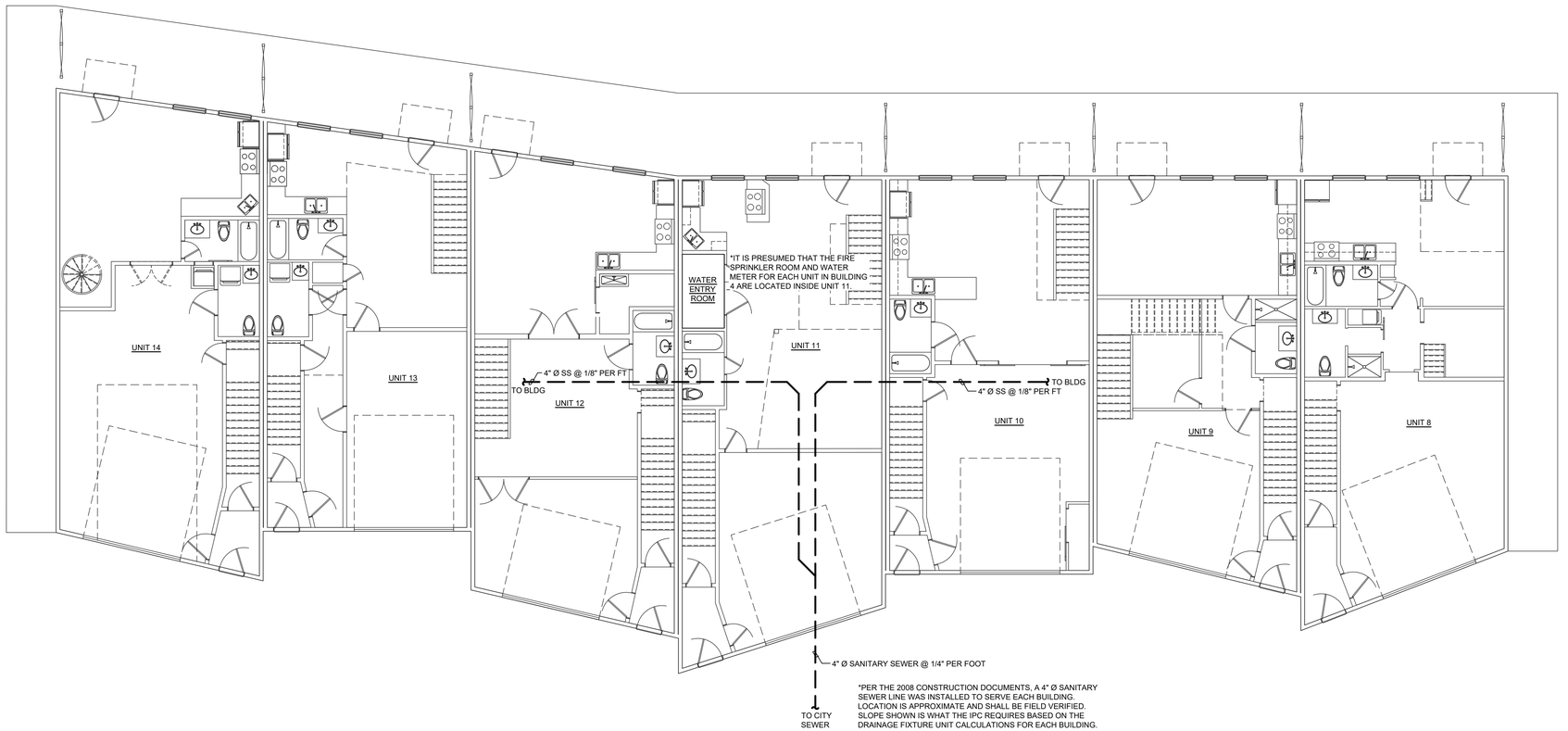
CHECKED BY:	---
SCALE:	AS SHOWN
SHEET NUMBER:	MP1-3

October 17, 2024 - 4:36:19pm



MECHANICAL & PLUMBING - B4 LEVEL 1 FLOOR PLAN

SCALE: 1/8" = 1'-0"

NORTH

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RIVERFRONT INDUSTRIAL PARK

MECHANICAL & PLUMBING - B4 LEVEL 1 FLOOR PLAN

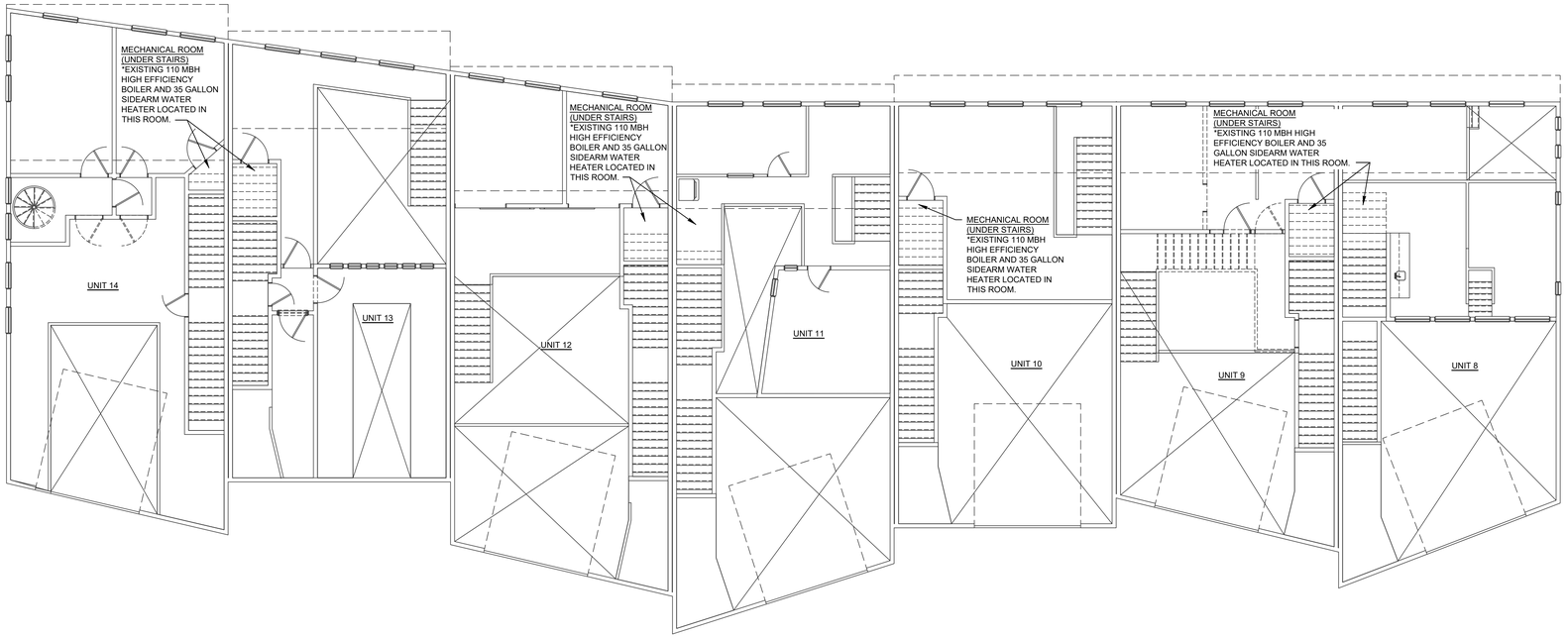
1522 SHIELD DRIVE
STEAMBOAT SPRINGS, COLORADO

DATE:	ISSUED FOR:
09/17/2024	UNIT 2 - PERMIT
10/17/2024	ALL UNITS - PERMIT

COLORADO LICENSED
SHAWN P. BRILZ
25400
10/17/24
PROFESSIONAL ENGINEER

DATE:	09/06/2024
JOB NO:	24-056
DRAWN BY:	---
CHECKED BY:	---
SCALE:	AS SHOWN
SHEET NUMBER:	MP1-4

October 17, 2024 - 4:36:19pm



MECHANICAL & PLUMBING - B4 LEVEL 2 FLOOR PLAN

SCALE: 1/8" = 1'-0"

NORTH

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RIVERFRONT INDUSTRIAL PARK

MECHANICAL & PLUMBING - B4 LEVEL 2 FLOOR PLAN

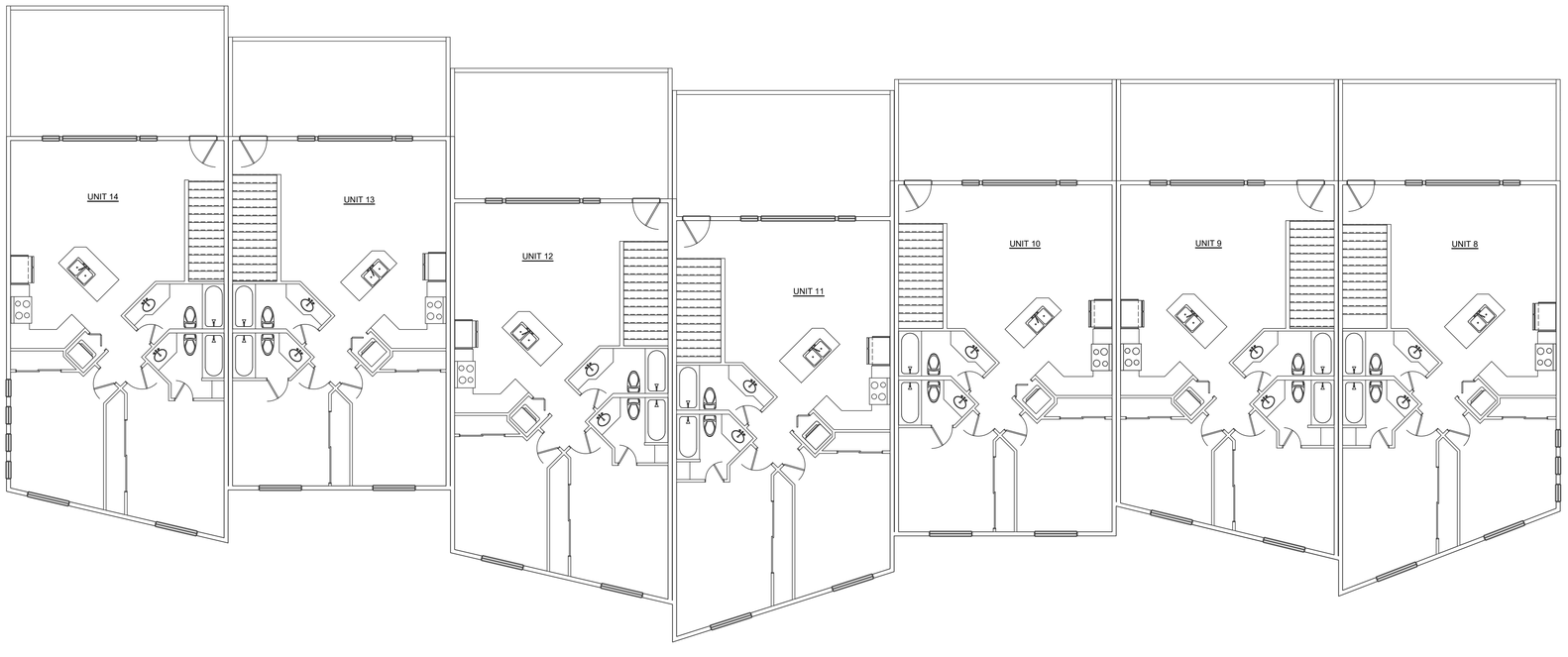
1522 SHIELD DRIVE
STEAMBOAT SPRINGS, COLORADO

DATE:	ISSUED FOR:
09/17/2024	UNIT 2 - PERMIT
10/17/2024	ALL UNITS - PERMIT

COLORADO LICENSED
SHAWN P. BRILZ
25400
10/17/24
PROFESSIONAL ENGINEER

DATE:	09/06/2024
JOB NO.:	24-056
DRAWN BY:	---
CHECKED BY:	---
SCALE:	AS SHOWN
SHEET NUMBER:	MP1-5

October 17, 2024 - 4:36:19pm



MECHANICAL & PLUMBING - B4 LEVEL 3 FLOOR PLAN

SCALE: 1/8" = 1'-0"

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Grand Junction, CO 81501
Phone: (970) 241-8709

RIVERFRONT INDUSTRIAL PARK

MECHANICAL & PLUMBING - B4 LEVEL 3 FLOOR PLAN

1522 SHIELD DRIVE
STEAMBOAT SPRINGS, COLORADO

DATE:	ISSUED FOR:
09/17/2024	UNIT 2 - PERMIT
10/17/2024	ALL UNITS - PERMIT

COLORADO LICENSED
SHAWN P. BRILL
25400
10/17/24
PROFESSIONAL ENGINEER

DATE:	09/06/2024
JOB NO:	24-056
DRAWN BY:	---
CHECKED BY:	---
SCALE:	AS SHOWN

SHEET NUMBER:
MP1-6

October 17, 2024 - 4:36:19pm

DRAINAGE FIXTURE FIXTURE CALCULATIONS BASED ON 2015 IPC TABLE 709.1			
PROJECT: RIVERFRONT PARK - BUILDING 3 - EXISTING CONDITIONS	**DATE: SEPTEMBER 2024**		
FIXTURE TYPE	**DRAINAGE FIXTURE UNIT**	**PLUMB FIX QNTY**	**TOTAL DRAINAGE FIXTURE UNITS**
AUTOMATIC CLOTHES WASHERS, RESIDENTIAL	2	**9**	18
BATHROOM GROUP AS DEFINED IN SECTION 202 (1.6 GPF WATER CLOSET)	5	**21**	105
DISHWASHING MACHINE, DOMESTIC	2	**7**	14
KITCHEN SINK, DOMESTIC	2	**1**	2
KITCHEN SINK, DOMESTIC WITH FOOD WASTE DISPOSER AND OR DISHWASHER	2	**11**	22
LAVATORY	1	**5**	5
WATER CLOSET, PRIVATE (1.6 GPF)	3	**5**	15
	APPROXIMATE GPM	**TOTAL DRAINAGE FIXTURE UNITS**	
	90.50	181	

DRAINAGE FIXTURE FIXTURE CALCULATIONS BASED ON 2015 IPC TABLE 709.1			
PROJECT: RIVERFRONT PARK - BUILDING 3 - FIXTURES TO REMAIN AFTER PERMITTING	**DATE: SEPTEMBER 2024**		
FIXTURE TYPE	**DRAINAGE FIXTURE UNIT**	**PLUMB FIX QNTY**	**TOTAL DRAINAGE FIXTURE UNITS**
AUTOMATIC CLOTHES WASHERS, RESIDENTIAL	2	**9**	18
BATHROOM GROUP AS DEFINED IN SECTION 202 (1.6 GPF WATER CLOSET)	5	**18**	90
DISHWASHING MACHINE, DOMESTIC	2	**7**	14
KITCHEN SINK, DOMESTIC	2	**1**	2
KITCHEN SINK, DOMESTIC WITH FOOD WASTE DISPOSER AND OR DISHWASHER	2	**10**	20
LAVATORY	1	**6**	6
WATER CLOSET, PRIVATE (1.6 GPF)	3	**6**	18
	APPROXIMATE GPM	**TOTAL DRAINAGE FIXTURE UNITS**	
	84.00	168	

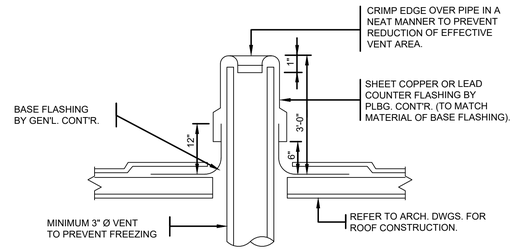
DRAINAGE FIXTURE FIXTURE CALCULATIONS BASED ON 2015 IPC TABLE 709.1			
PROJECT: RIVERFRONT PARK - BUILDING 4 - EXISTING CONDITIONS	**DATE: SEPTEMBER 2024**		
FIXTURE TYPE	**DRAINAGE FIXTURE UNIT**	**PLUMB FIX QNTY**	**TOTAL DRAINAGE FIXTURE UNITS**
AUTOMATIC CLOTHES WASHERS, RESIDENTIAL	2	**12**	24
BATHROOM GROUP AS DEFINED IN SECTION 202 (1.6 GPF WATER CLOSET)	5	**22**	110
DISHWASHING MACHINE, DOMESTIC	2	**7**	14
KITCHEN SINK, DOMESTIC	2	**1**	2
KITCHEN SINK, DOMESTIC WITH FOOD WASTE DISPOSER AND OR DISHWASHER	2	**14**	28
LAVATORY	1	**2**	2
SERVICE SINK	2	**1**	2
WATER CLOSET, PRIVATE (1.6 GPF)	3	**2**	6
	APPROXIMATE GPM	**TOTAL DRAINAGE FIXTURE UNITS**	
	94.00	188	

DRAINAGE FIXTURE FIXTURE CALCULATIONS BASED ON 2015 IPC TABLE 709.1			
PROJECT: RIVERFRONT PARK - BUILDING 4 - FIXTURES TO REMAIN AFTER PERMITTING	**DATE: SEPTEMBER 2024**		
FIXTURE TYPE	**DRAINAGE FIXTURE UNIT**	**PLUMB FIX QNTY**	**TOTAL DRAINAGE FIXTURE UNITS**
AUTOMATIC CLOTHES WASHERS, RESIDENTIAL	2	**12**	24
BATHROOM GROUP AS DEFINED IN SECTION 202 (1.6 GPF WATER CLOSET)	5	**22**	110
DISHWASHING MACHINE, DOMESTIC	2	**7**	14
KITCHEN SINK, DOMESTIC	2	**1**	2
KITCHEN SINK, DOMESTIC WITH FOOD WASTE DISPOSER AND OR DISHWASHER	2	**14**	28
LAVATORY	1	**2**	2
SERVICE SINK	2	**1**	2
WATER CLOSET, PRIVATE (1.6 GPF)	3	**2**	6
	APPROXIMATE GPM	**TOTAL DRAINAGE FIXTURE UNITS**	
	94.00	188	

TABLE 710.1(1) BUILDING DRAINS AND SEWERS

DIAMETER OF PIPE (inches)	MAXIMUM NUMBER OF DRAINAGE FIXTURE UNITS CONNECTED TO ANY PORTION OF THE BUILDING DRAIN OR THE BUILDING SEWER, INCLUDING BRANCHES OF THE BUILDING DRAIN[a]			
	Slope per foot			
	1/16 inch	1/8 inch	1/4 inch	1/2 inch
1 1/4	—	—	1	1
1 1/2	—	—	3	3
2	—	—	21	26
2 1/2	—	—	24	31
3	—	36	42	50
4	—	180	216	250
5	—	390	480	575
6	—	700	840	1,000
8	1,400	1,600	1,920	2,300
10	2,500	2,900	3,500	4,200
12	3,900	4,600	5,600	6,700
15	7,000	8,300	10,000	12,000

WATER HEATER SIZING PER 2011 ASHRAE HANDBOOK: REFERENCE TABLE FOR GPH									
PROJECT: RIVERFRONT PARK - UNIT WITH LARGEST HOT WATER DEMAND						**DATE: SEPTEMBER 2024**			
SPECIFIC HEAT WATER (BTU/LB*F)	**ENTERING WATER TEMPERATURE (F)**	**LEAVING WATER TEMPERATURE (F)**	**TEMPERATURE DIFFERENTIAL (F)**	**DENSITY OF WATER (LB/GAL)**	**BUILDING TYPE**				
1	40	140	100	8.34	PRIVATE RESIDENCE				
FIXTURE	**FIXTURE DEMAND GPH**	**QUANTITY**	**GPH**	**TOTAL GPH**	**DEMAND FACTOR**	**STORAGE CAPACITY FACTOR**	**CORRECTED TOTAL GPH**	**EFFICIENCY**	**REQ. BTUH**	**REQ. KW**
BATHROOM SINK	2	5	10	215	0.4	0.7	86	100%	71724	
SHOWER	30	4	120					90%	79693	
WASHER MACHINE	20	2	40					80%	89655	
KITCHEN SINK	10	3	30					70%	102463	
DISHWASHER	15	1	15					60%	119540	
							STORAGE REQUIREMENT (GAL)			
							60.2			



PLUMBING VENT THROUGH FLAT ROOF DETAIL

NOT TO SCALE

ASHRAE HVAC APPLICATIONS FIGURE 27 BOILER CALC		
PROJECT: RIVERFRONT PARK - ALL UNITS		
LOAD TYPE	**BTU/HR**	**BOILER DEMAND FACTOR**
SNOWMELT	0	0.80586451
RADIANT	98900	
DOM. HEATING	79700	
FAN COILS	0	
CORRECTION FACTOR FROM FIGURE 27	**SUMMED BTU/HR**	**CORRECTED TOTAL AFTER DEMAND FACTOR**
0.68	178600	153096
ALTITUDE (FT)	**EFFICIENCY OF BOILER**	**TOTAL BTU/HR AFTER ELEVATION AND EFFICIENCY**
6800	0.95	188078.62
EXISTING BOILER CAPACITY (BTU/HR)		110000
RECOMMENDED BOILER SIZE (BTU/HR)		199000
EXISTING WATER HEATER TANK SIZE (GAL)		35
RECOMMENDED WATER HEATER TANK SIZE (GAL)		60

BIGHORN CONSULTING ENGINEERS, CO.

386 Indian Road, Grand Junction, CO 81501 ♦ Phone: (970) 241-8709 ♦ www.bighorneng.com

Riverfront Park Post-Construction Permitting Process
Relevant Codes: 2021 IMC & 2021 IPC

Included Units: 2, 3, 4, 8, 9, 10, 12, 13, 14
Excluded Units: 1, 5, 6, 7, 11

"Included Units" are the individual units that are expected to show code compliance and obtain permits for modification that have already been completed. For these units to show compliance, they will have to comply with these mechanical and plumbing drawings and supplementary documents. The M&P drawings do not reflect any other changes that must be made according to other disciplines (i.e. structural or electrical).

"Excluded Units" are the individual units that are expected to restore their units to how they were originally permitted per the 2008 construction documents. Only the spaces, walls, appliances and plumbing fixtures originally shown on the drawings are permitted in these units. Generally speaking, this will mean that the typical "original" unit will comprise of a main level warehouse space with a powder room and an upper level two-bedroom and two-bathroom apartment. "Excluded Units" will not require any modification to their existing plumbing or mechanical infrastructure.

The following pertains to only the "Included Units":

No major modifications are expected to be made for the "Included Units" in terms of drainage piping. The drainage fixture calculations show that a 4" line is still satisfactory for the number of plumbing fixtures installed. It is worth noting that on Building 4, the 4" Ø sanitary line leaving the building should be sloped at 1/4" per linear foot of drain piping (see note on drawings for explanation). All other 3" Ø and 4" Ø sanitary lines should be sloped at 1/8" per foot. This is the minimum per the IPC (International Plumbing Code) and while it is expected that these lines were installed under these guidelines, this should still be field verified.

All plumbing fixtures, original and added, shall be vented per the IPC.

No modifications to the floor drains in the warehouse spaces should have been made, nor are any anticipated. The 1,000-gallon sand/oil interceptor installed outside each building is sufficiently sized for its original intended purpose. It is recommended that the sand/oil interceptor be cleaned and inspected if it is not already part of the HOAs routine maintenance plan. It shall also be verified that no black waste is being routed into the sand/oil interceptor.

Total (maximum) domestic flow rate for Building 3 is 61 GPM and for Building 4 is 65 GPM. Our plumbing fixture calcs call for each building having a 2" Ø domestic water entry with a 1-1/4" Ø cold water line serving each "Included Unit". These sizes are what we would call for if the building were being built today, however these pipe diameters have not been field verified. If a minimum of a 2" Ø water entry is not present in either building, a pressure and flow test must be completed in each water entry room. The test should be conducted after the pressure reducing valve, backflow preventer and water meter, but before any reduction in pipe sizes or branching off from the main line occurs. The tests should yield a minimum flowrate of 61 or 65 GPM (depending on the building) at 65 PSI. If each unit is not supplied by a 1-1/4" Ø domestic cold water supply line, then it should be expected that tub fill times and general flow rates out of plumbing fixtures may experience a reduction in typical flow and pressure due to the pipe diameter being too small. If individual unit owners are experiencing any cases of reduced flow or feel any of their plumbing fixtures are underserved, the size of the domestic supply line to each unit is likely the culprit. Increasing the size of the line between the water entry room and the individual unit would be the solution. Coordinating the replacement/upsizing of the supply line shall be coordinated between the induvial units' owners and a licensed plumber. Code will not require upsizing the lines to the individual units, however if the building's pressure and flow test yields less than favorable results, it may be desired by the individual unit owners to come up with a solution for increasing building water pressure and flow. If results do not meet or exceed suggested values (above) please consult with mechanical engineer.

Deck snowmelt was originally installed on the upper-level deck; however, it should have been disconnected in all 14 units and shall remain disconnected.

Each unit is heated using in-floor hydronic heat. The heat source for the radiant heat is a 110 MBH gas-fired boiler. This boiler is also responsible for generating domestic hot water via an "sidearm" indirect water heater. The tank size in each unit is only 35 gallons. Both the hot water tank and boiler are undersized for each "Included Unit" given the additional plumbing fixtures and square footage that was added in many of these units. Code will not require these boilers or water heaters be replaced. However, if unit owners find that their boilers cannot keep up with heating demand (radiant or hot water) it would be recommended they replace their current boiler with a 199 MBH boiler and their water heater with a 60-gallon indirect hot water heater. Considering the age of the existing mechanical equipment at almost 20 years old, it may be wise to consider replacement of these items in the near future.

Gas meter and line sizing is anticipated to remain untouched. Each unit should be served by a typical 250 CFH residential style low pressure gas meter. This meter is sufficient for current conditions and each unit's gas load. Increasing boiler size (as mentioned above) should not cause any issues with the gas line sizing or the meter itself. If gas pressure at any appliance (namely the boiler) is too low, it is likely the gas pressure being delivered by the meter is too low. Each meter should be delivering 8"-10" W.C with a minimum pressure of 6" W.C. at each appliance.

An exhaust fan shall be present in all bathrooms that include either a water closet (toilet), shower or bathtub. Each exhaust fan shall be ducted to the outside and be capable of exhausting a minimum of 50 CFM. If exhaust fans are not present in any bathroom, original or added, one should be added and installed in compliance with the IMC. Panasonic's "WhisperFit" fan is a quiet and cost-effective option that is intended for retrofit applications. The exhaust fan in each restroom may be controlled by a dedicated switch, a timer, a motion-occupancy sensor or be wired to come on with the lights.

Residential kitchen exhaust must be provided in each kitchen. The IMC calls for 50 CFM of continuous ventilation or 100 CFM of intermittent ventilation. The original kitchens installed upstairs should have exhaust hoods that vent to the outside, thus satisfying this requirement. The other kitchen installed in various other locations within the "Included Units" should have an exhaust fan (similar to the recommended bathroom fan above) or a vent hood that exhausts to the exterior installed. That being said, no exhaust fans or hoods have been field verified.

As mentioned above, the individual units are slightly underserved in terms of heating. It also may be the case that added spaces do not have supplementary heat sources. Additional heat in non-original spaces may be added at the individual unit owner's request (pending available electrical capacity) to any added room(s). For open areas or rooms with exterior windows, a few feet of electric baseboard under the window should be sufficient. For bathrooms without supplementary or original heat, an electric heated towel warmer is often the best choice for getting more heat into the space as wall space is often limited in smaller restrooms.

Some units have installed mini-split air conditioning systems. These are acceptable to remain so long as the electrical capacity is available to accommodate these units.

Please do not hesitate to reach out with questions or if additional information is needed.

Kyle Krauland
kyle@bighorneng.com
(970) 312-8643

DO NOT REPRODUCE THESE DRAWINGS AND SPECIFICATIONS WITHOUT THE EXPRESSED WRITTEN PERMISSION OF THE DESIGNER. THE DRAWINGS AND SPECIFICATIONS ARE INSTRUMENTS OF THE SERVICE AND SHALL REMAIN THE PROPERTY OF THE DESIGNER WHETHER THE PROJECT FOR WHICH THEY ARE MADE IS EXECUTED OR NOT. THESE DRAWINGS AND SPECIFICATIONS SHALL NOT BE USED BY ANYONE ON ANY OTHER PROJECTS FOR ADDITIONS TO THIS PROJECT BY OTHERS EXCEPT BY THE EXPRESSED WRITTEN PERMISSION OF THE DESIGNER.

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RIVERFRONT INDUSTRIAL PARK

MECHANICAL & PLUMBING - DETAILS

1522 SHIELD DRIVE
STEAMBOAT SPRINGS, COLORADO

DATE:	ISSUED FOR:
09/17/2024	UNIT 2 - PERMIT
10/17/2024	ALL UNITS - PERMIT

COLORADO LICENSED
SHAWN P. SMILEY
25400
10/17/24
PROFESSIONAL ENGINEER

DATE:	09/06/2024
JOB NO:	24-056
DRAWN BY:	---
CHECKED BY:	---
SCALE:	
SHEET NUMBER:	MP3-1

October 17, 2024 - 4:36:20pm

MECHANICAL PROVISIONS

1. SCOPE OF WORK

A. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK, MATERIALS, AND LABOR TO SATISFY A COMPLETE WORKING SYSTEM WHETHER SPECIFIED OR IMPLIED.
B. ALL WORK IS TO BE PERFORMED IN STRICT COMPLIANCE WITH ALL LOCAL CODES AND ALL OTHER REGULATION GOVERNING WORK OF THIS NATURE.
C. THE CONTRACTOR SHALL, BEFORE SUBMITTING ANY PROPOSAL, EXAMINE THE PROPOSED SITE AND SHALL DETERMINE FOR HIMSELF THE CONDITIONS THAT MAY EFFECT THE WORK. NO ALLOWANCE SHALL BE MADE IF THE CONTRACTOR FAILS TO MAKE SUCH EXAMINATIONS.
D. ALL EQUIPMENT AND MATERIALS SHALL BE AS SPECIFIED OR "APPROVED EQUAL" BY THE ENGINEER OR ARCHITECT.

2. PERMITS

A. THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ANY AND ALL FEES.

3. SHOP DRAWINGS

A. SUBMIT MATERIAL LIST AND SHOP DRAWINGS FOR MAJOR EQUIPMENT TO THE ARCHITECT/ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL SUBMIT FIVE SETS OF SHOP DRAWINGS AND THEY SHALL BE CLEARLY LABELED.

4. FLEXIBLE DUCT WORK

A. FLEXIBLE TYPE DUCT SHALL BE OF TWO ELEMENT SPIRAL CONSTRUCTION COMPOSED OF A CORROSION RESISTANT METAL SUPPORTING SPIRAL AND COATED FABRIC WITH A MINERAL BASE. FLEXIBLE DUCT CONNECTORS SHALL BE LISTED BY U.L., CLASS 1 DUCTS, AND SHALL HAVE A FLAME SPREAD RATING NOT EXCEEDING 25 AND A SMOKE DEVELOPED RATING NOT EXCEEDING 50.
B. USE OF FLEXIBLE DUCTWORK SHALL BE LIMITED TO NO MORE THAN 6 LINEAR FEET PER RUN.
C. CONTRACTOR SHALL BE CAREFUL SO AS NOT TO KINK OR COLLAPSE FLEXIBLE DUCT.

5. REFRIGERANT

A. PIPING CONTRACTOR SHALL PROVIDE AND INSTALL REFRIGERANT PIPING IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND IN SUCH A WAY AS TO BE INCONSPICUOUS AND FREE FROM ANY POSSIBLE CONDENSATION.
B. INSULATE REFRIGERANT LINES WITH ARMOUR-FLEX TYPE INSULATION, SHALL BE TYPE "K" COPPER TUBING, WITH WROUGHT COPPER SOLDER TYPE FITTINGS SUITABLE FOR CONNECTION WITH SILVER SOLDER.

6. DUCTWORK

A. THE DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE "SMACNA" APPLICABLE MANUALS.
B. ALL DUCTWORK SHALL BE THE LOW VELOCITY TYPE, UNLESS SPECIFIED OTHERWISE.
C. CONTRACTOR SHALL PROVIDE AND INSTALL APPROVED FIRE DAMPERS AND ACCESS PANELS IN ANY AND ALL DUCTWORK WHICH PENETRATES A HORIZONTAL OR VERTICAL FIRE PARTITION, OR AS OTHERWISE SHOWN ON DRAWINGS.
D. ALL BRANCH DUCTS TO HAVE VOLUME DAMPERS, SMOOTH TURN RADIUS DUCTWORK OR TURNING VANES SHALL BE USED THROUGHOUT WHERE FLOW EXCEEDS 150 CFM.
E. ALL DUCT JOINTS TO BE SEALED IN ACCORDANCE WITH "SMACNA" STANDARDS AND ACCEPTED GOOD PRACTICE.
F. ALL DUCT DIMENSIONS SHOWN ARE NET INSIDE VALUES.DIMENSIONS MAY BE CHANGED SO LONG AS THE NET FREE FACE AREA IS MAINTAINED.
G. ALL CONCEALED DUCTWORK SHALL BE INSULATED WITH 1-1/2" FIBERGLASS INSULATING BLANKET WITH ALUMINUM FOIL FACING.
H. ALL SUPPLY AND RETURN DUCTWORK 15 FEET DOWNSTREAM OF THE HVAC UNIT SHALL BE INTERNALLY LINED WITH A 1/2" ACOUSTICAL DUCT LINER UNLESS OTHERWISE NOTED ON THE DRAWINGS.

7. DRAINAGE PIPING

A. (CONDENSATE) SHALL BE SCHEDULE 40 PVC PIPE WITH SOLVENT JOINTS. PITCH HORIZONTAL LINES 1" IN 10'-0". CONDENSATE DRAINS SHALL BE ROUTED TO FLOOR DRAIN, ROOF DRAIN OR INDIRECT WASTE DRAIN.

8. HVAC CONTROLS

A. CONTRACTOR TO SUPPLY AND INSTALL ALL CONTROL WIRING AND THERMOSTATS AS REQUIRED.

9. ELECTRICAL

A. CONTRACTOR TO COORDINATE WITH ELECTRICAL CONTRACTOR FOR LOCATION OF WIRING FOR EACH HVAC UNIT.

10. PIPE SUPPORTS

A. ALL PIPE SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE IN A NEAT AND WORKMANLIKE MANNER. THE USE OF WIRE OR METAL STRAP TO SUPPORT PIPES WILL NOT BE PERMITTED. SPACING OF PIPE SUPPORTS SHALL NOT EXCEED 8 FEET FOR ALL PIPING. PLASTIC PIPING TO BE SUPPORTED EVERY 4 FEET.

11. GAS PIPING

A. PIPING SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH MALLEABLE IRON FITTINGS. WHERE GAS PIPE CONNECTS TO EQUIPMENT, IT SHALL BE PROVIDED WITH A DRIP LEG THE FULL SIZE OF THE RUNOUT, A 100% SHUT-OFF VALVE AND A UNION. GAS PIPING CONTAINING PRESSURE GREATER THAN 9" W.G. SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH WELDED JOINTS.

12. MISCELLANEOUS

A. ALL EXTERIOR OPENINGS TO BE PROPERLY CAULKED AND SEALED WITH A SEALANT OF HIGH QUALITY AND LONG LIFE, TO PREVENT INFILTRATION OF OUTSIDE AIR INTO CONDITIONED SPACE. COORDINATE INSTALLATION OF ALL ROOF FLASHING AT ROOF PENETRATION.
B. DO NOT SCALE THIS DRAWING FOR EXACT DIMENSIONS.
C. VERIFY ALL FIGURES, CONDITIONS, AND DIMENSIONS AT THE JOB SITE.
D. THE MECHANICAL PLANS ARE INTENDED TO BE DIAGRAMMATIC AND ARE BASED ON ONE MANUFACTURE'S EQUIPMENT. THEY ARE NOT INTENDED TO SHOW EVERY ITEM IN ITS EXACT LOCATION, THE EXACT DIMENSIONS, OR ALL THE DETAILS OF THE EQUIPMENT.
E. THE CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS OF THE EQUIPMENT PROPOSED TO ENSURE THAT THE EQUIPMENT WILL FIT IN THE AVAILABLE SPACE.
F. PEX TUBING. IF PEX TUBING IS USED AS AN APPROVED ALTERNATE FOR APPLICATIONS WHERE METALLIC PIPING IS THE BASIS OF DESIGN. THE PEX MANUFACTURER SHALL SUBMIT SHOP DRAWINGS CLEARLY INDICATING THAT THE DESIGN HAS BEEN ANALYZED AND MODIFIED, AS REQUIRED TO MAINTAIN SCHEDULED HYDRONIC SYSTEM PARAMETERS. ANY DESIGN RESULTING IN INCREASED SYSTEM PRESSURE DROP AS A RESULT OF IMPROPER PEX SIZING OR DESIGN SHALL NOT BE PERMITTED.

13. TESTING AND BALANCING

A. THE HVAC SYSTEM SHALL BE TESTED AND AND BALANCED BY AN INDEPENDENT AGENCY, UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER. A SEALED TYPE WRITTEN REPORT SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER FOR REVIEW AND APPROVAL.

14. GUARANTEE

A. MATERIALS, EQUIPMENT AND INSTALLATION SHALL BE GUARANTEED FOR A PERIOD OF ONE(1) YEAR FROM DATE OF ACCEPTANCE. DEFECTS WHICH APPEAR DURING THAT PERIOD SHALL BE CORRECTED AT THIS CONTRACTOR'S EXPENSE.
B. FOR THE SAME PERIOD, THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO PREMISES CAUSED BY DEFECTS IN WORKMANSHIP OR IN THE WORK OR EQUIPMENT FURNISHED AND/OR INSTALLED BY HIM.

PLUMBING SPECIFICATION

1. SCOPE OF WORK

A. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK, MATERIALS, AND LABOR TO SATISFY A COMPLETE WORKING SYSTEM WHETHER SPECIFIED OR IMPLIED.
B. ALL WORK IS TO BE PREFORMED IN STRICT COMPLIANCE WITH THE INTERNATIONAL PLUMBING CODE (LATEST EDITION), ALL LOCAL CODES AND ALL OTHER REGULATION GOVERNING WORK OF THIS NATURE.
C. THE CONTRACTOR SHALL, BEFORE SUBMITTING ANY PROPOSAL, EXAMINE THE PROPOSED SITE AND SHALL DETERMINE FOR HIMSELF THE CONDITIONS THAT MAY AFFECT THE WORK. NO ALLOWANCE SHALL BE MADE IF THE CONTRACTOR FAILS TO MAKE SUCH EXAMINATIONS.
D. ALL EQUIPMENT AND MATERIALS SHALL BE AS SPECIFIED OR "APPROVED AS EQUAL" BY THE ENGINEER OR ARCHITECT.

2. PERMITS

A. THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ANY AND ALL FEES.

3. SHOP DRAWINGS

A. SUBMIT MATERIAL LIST AND SHOP DRAWINGS FOR MAJOR EQUIPMENT TO THE ARCHITECT/ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL SUBMIT FIVE SETS OF SHOP DRAWINGS AND THEY SHALL BE CLEARLY LABELED.

4. DOMESTIC WATER SUPPLY PIPING

A. UNDERGROUND: PROVIDE TYPE "K" SOFT DRAWN COPPER TUBING WITH BRAZED CONNECTIONS.
B. ABOVE GROUND: PROVIDE TYPE "L" HARD DRAWN COPPER TUBING WITH 125 PSI SOLDER JOINTS, COPPER OR BRASS FITTINGS. ALL SOLDER TO BE "NO LEAD" TYPE.
C. ALL HOT WATER PIPING TO BE INSULATED WITH 1" FIBERGLASS INSULATION.
D. ALL COLD WATER PIPING TO BE INSULATED WITH ½" FOAM INSULATION.

5. SANITARY/STORM DRAINAGE AND VENT PIPING

A. ABOVE GRADE:
A.A. -2" BELOW: SCHEDULE 40 GALV. STEEL PIPE WITH SCREWED ENDS OR SOLID CORE SCHEDULE 40 PVC WITH SOLVENT JOINTS OR DWV COPPER WITH SOLDER JOINTS. ALL SOLDER TO BE "NO LEAD" TYPE.
A.B. -3" AND ABOVE: SERVICE WT. CAST IRON WITH NO-HUB OR BELL AND SPIGOT JOINTS; OR SOLID CORE SCHEDULE 40 PVC WITH SOLVENT JOINTS.
B. BELOW GRADE: SERVICE WT. CAST IRON WITH NO-HUB OR BELL AND SPIGOT JOINTS; OR SOLID CORE SCHEDULE 40 PVC WITH SOLVENT JOINTS.
C. PVC PIPING SHALL NOT BE USED IN AIR PLENUM CEILINGS AND SHALL NOT CROSS FIRE RATED WALLS, CEILINGS, OR FLOORS.
D. DRAINAGE PIPING SHALL BE RUN AS STRAIGHT AS POSSIBLE AND SHALL HAVE LONG TURN FITTINGS.
E. DRAINAGE PIPING 3" SIZE AND SMALLER SHALL RUN AT A UNIFORM GRADE OF AT LEAST ¼" PER FOOT, AND PIPING LARGER THAN 3" SHALL BE RUN AT A GRADE OF NO LESS THAN ⅛" PER FOOT.
F. ALL VENT PIPING SHALL BE SLOPED TO DRAIN BACK TO FIXTURES.
G. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER FLASHING OF THE VENT PIPING RUN THROUGH THE ROOF.
H. PVC USED TO BE SOLID CORE TYPE SCHEDULE 40 PVC.

7. PIPE SUPPORTS

A. ABOVE GRADE: ALL PIPE SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE IN A NEAT AND WORKMANLIKE MANNER, THE USE OF WIRE AND PERFORATED METAL TO SUPPORT PIPES WILL NOT BE PERMITTED. SPACING OF PIPE SUPPORTS SHALL BE A S SPECIFIED IN INTERNATIONAL PLUMBING CODE (LATEST EDITION).
B. BELOW GRADE: EARTH SHALL BE EXCAVATED TO A MINIMUM DEPTH WITH AN EVEN SURFACE TO INSURE SOLID BEARING OF PIPE FOR ITS ENTIRE LENGTH.
B.A. INTERIOR: THE PIPE SHALL BE INSTALLED (UNLESS OTHERWISE SPECIFIED) A MINIMUM OF 4 INCHES BELOW THE BOTTOM OF THE SLAB AND SHALL NOT BE IN ANY DIRECT CONTACT WITH THE CONCRETE AT ANY POINT.
B.B. EXTERIOR: THE WATER PIPE SHALL HAVE A MINIMUM OF 60" OF COVER AND THE SANITARY WASTE PIPE SHALL HAVE A MINIMUM OF 24" OF COVER.

8. MISCELLANEOUS

A. COORDINATE INSTALLATION OF ALL ROOFS FLASHING AT ROOF PENETRATIONS.
B. DO NOT SCALE THIS DRAWING FOR EXACT DIMENSIONS. VERIFY ALL FIGURES, CONDITIONS AND DIMENSIONS AT THE JOB SITE.
C. THE PLUMBING PLANS ARE INTENDED TO BE DIAGRAMMATIC AND ARE BASED ON ONE MANUFACTURER'S EQUIPMENT. THEY ARE NOT INTENDED TO SHOW EVERY ITEM IN ITS EXACT LOCATION. THE EXACT DIMENSIONS OR ALL THE DETAILS OF THE EQUIPMENT. THE CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS OF THE EQUIPMENT PROPOSED TO ENSURE THAT THE EQUIPMENT WILL FIT THE AVAILABLE SPACE.

9. TESTING

A. PLUMBING SYSTEM SHALL BE FLOW AND PRESSURE TESTED IN ACCORDANCE WITH THE INTERNATIONAL PLUMBING CODE (LATEST EDITION).

10. GUARANTEE

A. MATERIALS, EQUIPMENT AND INSTALLATION SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR FROM DATE OF ACCEPTANCE. DEFECTS WHICH APPEAR DURING THAT PERIOD SHALL BE CORRECTED AT THIS CONTRACTORS EXPENSE.
B. FOR THE SAME PERIOD THE PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO PREMISES CAUSED BY DEFECTS IN WORKMANSHIP OR IN THE WORK OR EQUIPMENT FURNISHED AND/OR INSTALLED BY HIM.

PLUMBING GENERAL NOTES:

1. DRAWING IS DIAGRAMMATIC IN NATURE. LOCATIONS AND SIZES MAY VARY DURING FIELD COORDINATION & INSTALLATION OF MECHANICAL, PLUMBING, & ELECTRICAL. DRAWINGS DO NOT NECESSARILY INDICATE EVERY REQUIRED OFFSET, FITTING, ETC. DRAWINGS ARE NOT TO BE SCALED FOR DIMENSIONS. TAKE ALL DIMENSIONS FROM ARCHITECTURAL DRAWINGS, CERTIFIED EQUIPMENT DRAWINGS AND FROM THE STRUCTURE ITSELF BEFORE FABRICATING ANY WORK, VERIFY ALL SPACE REQUIREMENTS COORDINATING WITH OTHER TRADES, AND INSTALL THE SYSTEMS IN THE SPACE PROVIDED WITHOUT EXTRA CHARGES TO THE OWNER.
2. PIPE DIMENSIONS DO NOT REFLECT ADDITIONAL DIMENSIONS FOR INSULATION. ALL PIPING SHALL BE INSULATED PER 2018 IECC CODE REQUIREMENTS.
3. CONDENSING WATER HEATER, GAS FURNACE, AND BOILER VENT MATERIAL SHALL COMPLY WITH MANUFACTURER'S LISTED AND APPROVED MATERIALS. PVC SHALL NOT BE USED FOR FLUE/COMBUSTION AIR VENTING MATERIAL. ENGINEERS PREFERRED MATERIAL IS PRESSURE RATED, DOUBLE WALL, GASKETED, 316 STAINLESS STEEL CONDENSING FLUE VENTING MATERIAL. RECOMMENDED MANUFACTURER'S SELKIRK OR JERMIAS.
4. ROUTE CONDENSATE FROM CONDENSING MECHANICAL EQUIPMENT TO CONDENSATE NEUTRALIZATION KITS. CONDENSATE FROM NEUTRALIZATION KITS SHALL BE DISCHARGED INDIRECTLY THROUGH AIR GAP TO NEAREST FLOOR DRAIN.
5. ALL PLUMBING FIXTURES WITH QUICK CLOSING VALVES ON DOMESTIC COLD/HOT WATER SHALL BE PROVIDED WITH WATER HAMMER ARRESTOR.
6. PROVIDE ISOLATION VALVES AT GROUP RESTROOMS TO ALLOW FOR TOTAL ISOLATION OF THE ENTIRE RESTROOM GROUP FROM THE REST OF THE DOMESTIC COLD, HOT AND HOT RE-CIRCULATION SYSTEMS.
7. ALL PLUMBING FIXTURES SHALL BE VENTED BY PLUMBING CONTRACTOR PER IPC REQUIREMENTS.
8. CONTRACTOR SHALL CLEAN AND SERVICE ALL EXISTING EQUIPMENT/PLUMBING FIXTURES TO REMAIN. CONTRACTOR SHALL VERIFY ALL EQUIPMENT/PLUMBING FIXTURES ARE PROPERLY FUNCTIONING PRIOR TO RE-USING EQUIPMENT/FIXTURES. CONTRACTOR TO INSURE THAT FINAL PLUMBING SYSTEM WILL OPERATE AS INTENDED ON PROVIDED DRAWINGS.
9. ALL EXTERIOR METALLIC NATURAL GAS PIPING SHALL BE TREATED WITH CORROSIVE INHIBITOR COATING. COATING SHALL BE APPLIED PER MANUFACTURER'S RECOMMENDATION SO THAT COATING MAINTAINS INTEGRITY OF GAS PIPING. COATING SHALL BE UV RESISTANT.

MECHANICAL GENERAL NOTES:

1. DRAWING IS DIAGRAMMATIC IN NATURE. LOCATIONS AND SIZES MAY VARY DURING FIELD COORDINATION & INSTALLATION OF MECHANICAL, PLUMBING, & ELECTRICAL. DRAWINGS DO NOT NECESSARILY INDICATE EVERY REQUIRED OFFSET, FITTING, ETC. DRAWINGS ARE NOT TO BE SCALED FOR DIMENSIONS. TAKE ALL DIMENSIONS FROM ARCHITECTURAL DRAWINGS, CERTIFIED EQUIPMENT DRAWINGS AND FROM THE STRUCTURE ITSELF BEFORE FABRICATING ANY WORK, VERIFY ALL SPACE REQUIREMENTS COORDINATING WITH OTHER TRADES, AND INSTALL THE SYSTEMS IN THE SPACE PROVIDED WITHOUT EXTRA CHARGES TO THE OWNER.
2. DUCT DIMENSIONS DO NOT REFLECT ADDITIONAL DIMENSIONS FOR INSULATION. ALL DUCTING SHALL BE INSULATED PER 2021 IECC CODE REQUIREMENTS. (SUPPLY AND RETURN AIR DUCTS AND PLENUMS SHALL BE INSULATED WITH NOT LESS THAN R-6 INSULATION WHERE LOCATED IN UNCONDITIONED SPACES AND WHERE LOCATED OUTSIDE THE BUILDING WITH NOT LESS THAN R-8 INSULATION IN CLIMATE ZONES 0 THROUGH 4 AND NOT LESS THAN R-12 INSULATION IN CLIMATE ZONES 5 THROUGH 8. DUCTS LOCATED UNDERGROUND BENEATH BUILDINGS SHALL BE INSULATED AS REQUIRED IN THIS SECTION OR HAVE AN EQUIVALENT THERMAL DISTRIBUTION EFFICIENCY. UNDERGROUND DUCTS UTILIZING THE THERMAL DISTRIBUTION EFFICIENCY METHOD SHALL BE LISTED AND LABELED TO INDICATE THE R-VALUE EQUIVALENCY. WHERE LOCATED WITHIN A BUILDING ENVELOPE ASSEMBLY, THE DUCT OR PLENUM SHALL BE SEPARATED FROM THE BUILDING EXTERIOR OR UNCONDITIONED OR EXEMPT SPACES BY NOT LESS THAN R-8 INSULATION IN CLIMATE ZONES 0 THROUGH 4 AND NOT LESS THAN R-12 INSULATION IN CLIMATE ZONES 5 THROUGH 8. ROUTT COUNTY IS **CLIMATE ZONE 7**)
3. COORDINATE FINAL LOCATION OF THERMOSTAT WITH OWNER PRIOR TO INSTALLATION. IF THERMOSTAT IS LOCATED ON EXTERIOR WALL PROVIDE THERMOSTAT WITH INSULATED BACKING.
4. CONDENSING WATER HEATER, GAS FURNACE, AND BOILER VENT MATERIAL SHALL COMPLY WITH MANUFACTURER'S LISTED AND APPROVED MATERIALS. PVC SHALL NOT BE USED FOR FLUE/COMBUSTION AIR VENTING MATERIAL. ENGINEERS PREFERRED MATERIAL IS PRESSURE RATED, DOUBLE WALL, GASKETED, 316 STAINLESS STEEL CONDENSING FLUE VENTING MATERIAL. RECOMMENDED MANUFACTURER'S SELKIRK OR JERMIAS.
5. ROUTE CONDENSATE FROM CONDENSING MECHANICAL EQUIPMENT TO CONDENSATE NEUTRALIZATION KITS. CONDENSATE FROM NEUTRALIZATION KITS SHALL BE DISCHARGED INDIRECTLY THROUGH AIR GAP TO NEAREST FLOOR DRAIN.
6. MECHANICAL CONTRACTOR SHALL FIELD LOCATE EXISTING DUCTWORK PRIOR TO CONSTRUCTION. MECHANICAL CONTRACTOR SHALL COORDINATE TIE IN CONNECTION POINTS OF NEW SUPPLY DIFFUSERS WITH EXISTING DUCTWORK AS NECESSARY.
7. CONTRACTOR SHALL CLEAN AND SERVICE ALL EXISTING EQUIPMENT TO REMAIN. CONTRACTOR SHALL VERIFY ALL EQUIPMENT TO REMAIN IS PROPERLY FUNCTIONING PRIOR TO RE-USING EQUIPMENT. CONTRACTOR TO INSURE THAT FINAL MECHANICAL SYSTEM WILL OPERATE AS INTENDED ON PROVIDED DRAWINGS.
8. MECHANICAL EQUIPMENT MANUFACTURERS AS SCHEDULED ON MECHANICAL DRAWINGS ARE SUGGESTED MANUFACTURER'S. UNLESS NOTED OTHERWISE DUE TO OWNER/CLIENT REQUIREMENTS AND PREFERENCES. MECHANICAL CONTRACTOR CAN SUBMIT EQUIVALENT EQUIPMENT FROM MANUFACTURERS THAT DIFFER FROM SCHEDULED MECHANICAL EQUIPMENT. ALTERNATE MANUFACTURERS OF MECHANICAL EQUIPMENT WILL BE REVIEWED FOR EQUIVALENCE OF PERFORMANCE AND FUNCTIONALITY BY ENGINEER.

DO NOT REPRODUCE THESE DRAWINGS AND SPECIFICATIONS WITHOUT THE EXPRESSED WRITTEN PERMISSION OF THE DESIGNER. THE DRAWINGS AND SPECIFICATIONS ARE INSTRUMENTS OF THE SERVICE AND SHALL REMAIN THE PROPERTY OF THE DESIGNER WHETHER THE PROJECT FOR WHICH THEY ARE MADE IS EXECUTED OR NOT. THESE DRAWINGS AND SPECIFICATIONS SHALL NOT BE USED BY ANYONE ON ANY OTHER PROJECTS FOR ADDITIONS TO THIS PROJECT BY OTHERS EXCEPT BY THE EXPRESSED WRITTEN PERMISSION OF THE DESIGNER.

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RIVERFRONT INDUSTRIAL PARK

MECHANICAL & PLUMBING - GENERAL NOTES

1522 SHIELD DRIVE
STEAMBOAT SPRINGS, COLORADO

DATE:	ISSUED FOR:
09/17/2024	UNIT 2 - PERMIT
10/17/2024	ALL UNITS - PERMIT

COLORADO LICENSED
SHAWN P. BRILL
25400
10/17/24
PROFESSIONAL ENGINEER

DATE:	09/06/2024
JOB NO:	24-056
DRAWN BY:	---
CHECKED BY:	---
SCALE:	

SHEET NUMBER:
MP3-2

October 17, 2024 - 4:36:22pm